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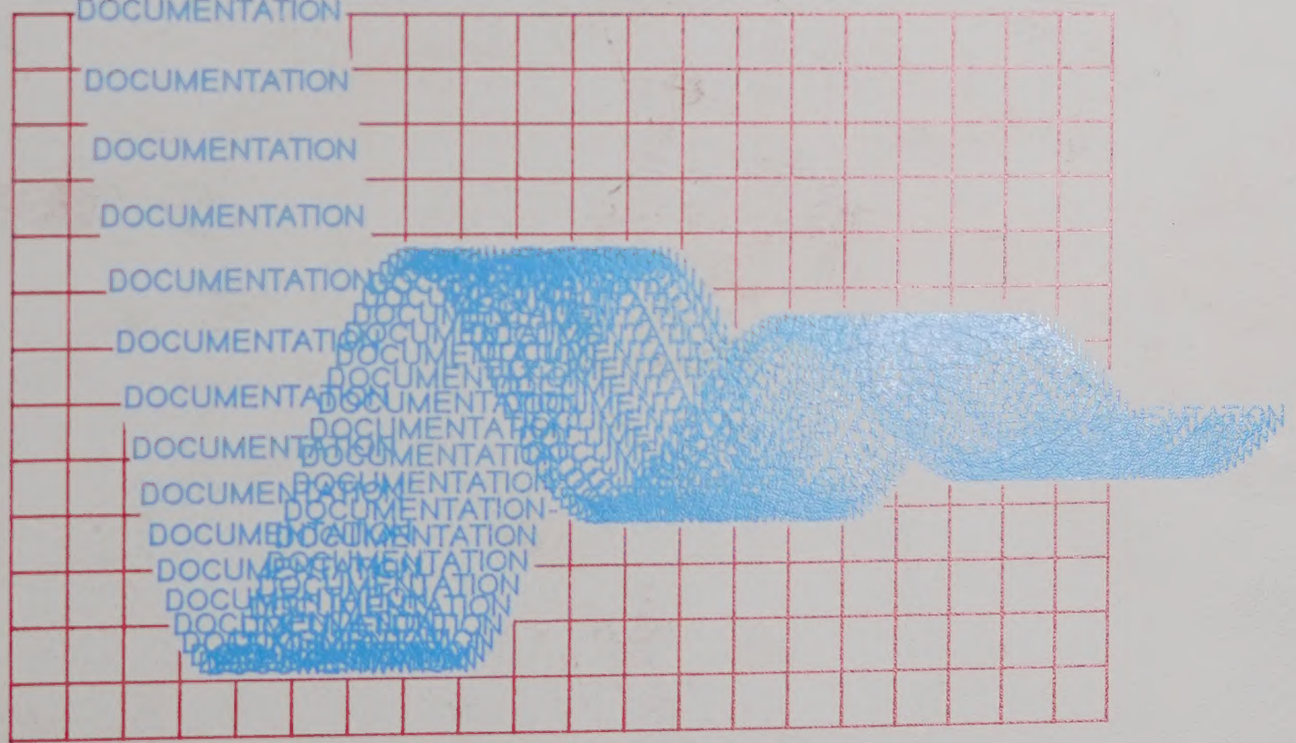

MP MASTER

MA22448

ROHDE&SCHWARZ

Test and Measurement
Division

Service Manual

VECTOR SIGNAL GENERATOR

SMIQ02/02W/03/03A/03W

1084.8004.02/02W/03/03A/03W

SMIQ02E/03E

1106.1506.02E/03E

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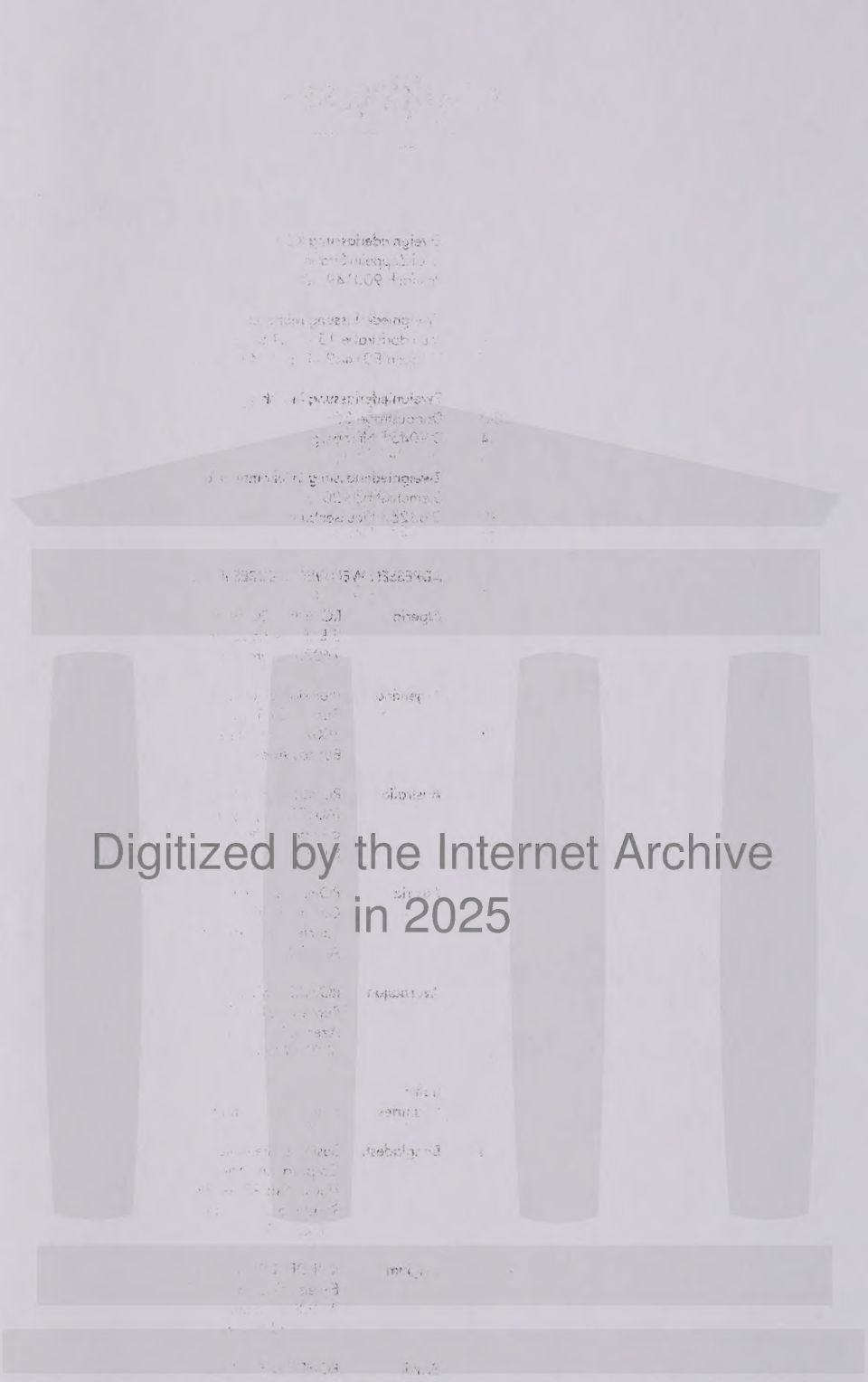
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Safety Instructions

This unit has been designed and tested in accordance with the EC Certificate of Conformity and has left the manufacturer's plant in a condition fully complying with safety standards.

To maintain this condition and to ensure safe operation, the user must observe all instructions and warnings given in this operating manual.

Safety-related symbols used on equipment and documentation from R&S:

Observe operating instructions

Weight indication for units >18 kg

PE terminal

Ground terminal

Danger! Shock hazard

Warning! Hot surfaces

Ground

Attention! Electrostatic sensitive devices require special care

1. The unit may be used only in the operating conditions and positions specified by the manufacturer. Unless otherwise agreed, the following applies to R&S products:

   IP degree of protection 2X, Pollution severity 2, overvoltage category 2, altitude max. 2000 m.

   The unit may be operated only from supply networks fused with max. 16 A.

2. For measurements in circuits with voltages V_{rms} > 30 V, suitable measures should be taken to avoid any hazards.

   (using, for example, appropriate measuring equipment, fusing, current limiting, electrical separation, insulation).

3. If the unit is to be permanently wired, the PE terminal of the unit must first be connected to the PE conductor on site before any other connections are made. Installation and cabling of the unit to be performed only by qualified technical personnel.

4. For permanently installed units without built-in fuses, circuit breakers or similar protective devices, the supply circuit must be fused such as to provide suitable protection for the users and equipment.

5. Prior to switching on the unit, it must be ensured that the nominal voltage set on the unit matches the nominal voltage of the AC supply network.

   If a different voltage is to be set, the power fuse of the unit may have to be changed accordingly.

6. Units of protection class I with disconnectible AC supply cable and appliance connector may be operated only from a power socket with earthing contact and with the PE conductor connected.

7. It is not permissible to interrupt the PE conductor intentionally, neither in the incoming cable nor on the unit itself as this may cause the unit to become electrically hazardous.

   Any extension lines or multiple socket outlets used must be checked for compliance with relevant safety standards at regular intervals.

8. If the unit has no power switch for disconnection from the AC supply, the plug of the connecting cable is regarded as the disconnecting device. In such cases it must be ensured that the power plug is easily reachable and accessible at all times (length of connecting cable approx. 2 m). Functional or electronic switches are not suitable for providing disconnection from the AC supply.

   If units without power switches are integrated in racks or systems, a disconnecting device must be provided at system level.

9. Applicable local or national safety regulations and rules for the prevention of accidents must be observed in all work performed.

   Prior to performing any work on the unit or opening the unit, the latter must be disconnected from the supply network.

   Any adjustments, replacements of parts, maintenance or repair may be carried out only by authorized R&S technical personnel.

   Only original parts may be used for replacing parts relevant to safety (eg power switches, power transformers, fuses). A safety test must be performed after each replacement of parts relevant to safety.

   (visual inspection, PE conductor test, insulation-resistance, leakage-current measurement, functional test).

continued overleaf

10. Ensure that the connections with information technology equipment comply with IEC950 / EN60950.
11. Lithium batteries must not be exposed to high temperatures or fire.

    Keep batteries away from children.

    If the battery is replaced improperly, there is danger of explosion. Only replace the battery by R&S type (see spare part list).

    Lithium batteries are suitable for environmentally-friendly disposal or specialized recycling. Dispose them into appropriate containers, only.

    Do not short-circuit the battery.
12. Equipment returned or sent in for repair must be packed in the original packing or in packing with electrostatic and mechanical protection.
13. Electrostatics via the connectors may damage the equipment. For the safe handling and operation of the equipment, appropriate measures against electrostatics should be implemented.
14. Any additional safety instructions given in this manual are also to be observed.

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7 Testing and Repair of Modules

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1 Testing and Repair of the Instrument

1.1 Function Description

For the following see function circuit diagram 1084.8004.FS for the SMIQ models and 1106.1506.FS for the SMIQ-E models. The models 02 provide an upper frequency limit of 2.2 GHz. Of course, all measurements on these models should be performed in the reduced frequency range, only.

1.1.1 Theory of Synthesis

The synthesis first generates a frequency range from 750 to 1500 MHz.

The fine resolution is implemented by direct digital synthesis in the **SMIQ.** The optional frequency/phase modulation is also converted to this frequency by mixing such that it can be coupled in here.

A **step synthesizer** with a fractional divider produces an auxiliary frequency which is applied to a harmonic mixer. The output oscillators are synchronized with the frequency of the digital synthesis after mixing with a harmonic of the auxiliary frequency. The frequency of the **main octave** then corresponds to the sum of the frequency of the selected harmonic of the auxiliary frequency and the frequency of the digital synthesis.

Further frequency extension is obtained by **division** and **mixing**.

In the **SMIQ-E,** the complete synthesis is implemented in the TSYN module. The latter contains a **one-loop synthesizer** from 750 to 1500MHz, frequency divider, a 10-MHz standard reference crystal and a 600-MHz oscillator with dividers for generation of the internal reference frequencies of the instrument.

The **vector modulation** is generated in all models at a fixed frequency of 300 MHz and added to the synthesis frequency, if this operating mode has been selected. Tunable filters suppress spuriae which occur.

1.2 The Modules

1.2.1 Digital Synthesis (A8)

The fine resolution of the output frequency is implemented by direct digital synthesis in this module. A gate array provides instantaneous values of a sinewave oscillation produced by computation to a D/A converter which generates the analog signal. A series-connected lowpass filter suppresses the alias frequencies.

Since the digital synthesis delivers a wide spectrum of spurious frequencies, a buffer loop is series-connected. Its bandwidth can be switched in two steps. For normal operation, the small

bandwidth is designed such that spuriae 10kHz beside the carrier are suppressed more than 80dB. The large bandwidth at about 200 kHz is used in fast list mode and for lock-in.

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1.2.2 FM-Modulator (Option B5)

The FM modulator provides the analog frequency and phase modulation at the frequency of the digital synthesis. A modulated 100-MHz VCO can be operated in two control loops: a phase-locked loop with a control bandwidth of approx. 200 kHz for the phase modulation and a slow frequency control loop for FM. Since the input frequency must be maintained, a fixed frequency of 100 MHz is used for up-conversion. A combination of highpass and lowpass filters is used to suppress unwanted mixed products. Then the modulated 100-MHz signal is used for down-conversion so that the input frequency is obtained again. The resulting mixed products are eliminated by a lowpass filter.

The phase comparison for both control loops is performed at 10 MHz. With phase modulation, a conventional phase-locked loop with a control bandwidth of 200 kHz is closed, the modulation signal being fed in after the phase detector. With FM, the signal of the phase detector is used to generate a pulse sequence with the differential frequency which is applied to a differential integrator which receives the modulation signal as a reference. If the average values of the two signals deviate from each other, a correction voltage is produced, which maintains the center frequency of the oscillator at the correct value even with FM-DC.

In order for the phase-locked loop to remain in the linear section of the oscillator characteristic, the integrator voltage is automatically kept at its value during switchover by means of a counter and a D/A converter.

1.2.3 Reference/Step Synthesis (A7)

This module generates some reference frequencies of high spectral purity for the synthesis stages as well as the auxiliary frequency for the harmonic mixer which can be set in steps.

1.2.3.1 Reference Frequencies

As internal time base for the complete synthesis, a temperature-compensated 10-MHz crystal oscillator (TCXO) is used, which can be optionally replaced by an oven-controlled oscillator (OCXO). As noise reference, a 100-MHz crystal oscillator is used which is synchronized with the 10-MHz crystal or also with external references of 1 to 16 MHz with very small bandwidth.

The reference frequency lies at 1 MHz. The divider of the 100-MHz crystal oscillator features a 10-MHz output for synchronization of connected devices. A programmable divider from 1 to 16 permits synchronization with external sources of 1 to 16 MHz in 1-MHz steps.

The 100-MHz signal of the crystal oscillator is used for mixing and synchronization in the FM modulator. The signal divided by two is fed through several modules as clock frequency.
By trebling and doubling, a 600-MHz signal is produced which feeds the fractional divider of the step synthesis and is used as auxiliary frequency for the IQ modulator and broadband FM (option).

1.2.3.2 Step Synthesis

The auxiliary frequency for the harmonic mixer in the summing loop is generated in a phase-locked loop with fractional division ratio. The fractional divider is implemented as ECL gate array in order to obtain a high reference frequency and a large suppression of spuriae. Down-conversion of the synthesis oscillator with the 100-MHz crystal oscillator is also made with regard to spectral purity.

Since a mixer is used as phase detector, a preset into the lock-in range of the control loop is required, which also reduces the settling time. It is implemented by a parallel-operated frequency discriminator with window comparator.

1.2.4 Summing Loop(A9)

In the summing loop, the main octave and the divider frequency ranges of the synthesis are produced. Using a harmonic mixer, the signal of one harmonic of the step synthesis is converted into the frequency of the digital synthesis, where the phase comparison is made. A ^control bandwidth of 300 kHz is provided for a spectrum optimized with respect to noise.

A mixer is used as phase detector. For this reason and in order to force the synchronization to the correct harmonic, a preset into the lock-in range of the phase-locked loop is necessary, which is performed via a D/A converter according to a table stored in the computer and compensating for the temperature drift. Temperature compensation is accomplished by the internal diagnosis on the controller module. Correct functioning of the diagnosis is a prerequisite for synchronisation! Moreover, the table is set up using this diagnosis (see section Calibration Routines).

The SMIQ uses the first divided octave of the divider frequency ranges, thus ensuring that the output frequency range from 450 to 1500MHz is available for the IQ converter module.

1.2.5 Synthesizer TSYN (SMIQ-E)

A temperature-compensated 10-MHz crystal oscillator (TCXO) constitutes the internal time base for the complete synthesis, optionally, the TCXO can be replaced by an oven-controlled crystal oscillator(OCXO).

The 600-MHz oscillator is set up by means of a cermaic resonator which is fixed to the 10-MHz reference using a PLL with a 300-Hz bandwidth. A 50-MHz reference required for various modules is derived from the divider chain.

The one-loop synthesizer operates with a fundamental wave of 750 to 1500MHz. The extended frequency range is generated by binary division. The fundamental wave is generated in a PLL with fractional division ratio. The divider itself is realized by an ECL gate-array, a second CMOS gate array is provided for control and digital compensation of the nonharmonic of the fractional divider.

The FM/PhiM modulation is transmitted via two paths. In the first path, the dividing factor and thus, the current center frequency is modulated with FM using a sigma-delta converter subsequent to A/D conversion. In the second path, the oscillator is modulated, directly. The tuning slope of the oscillators is determined by means of a calibration routine.

With PhiM, the phase modulation is fed to the PLL subsequent to the phase detector in the first path. In the second path, the oscillator is again modulated directly after differentiation.

1.2.6 IQ-Converter (A220)

The IQ converter is provided for frequency extension by doubling and addition of the vector-modulated 300-MHz signal from the IQ modulator board (modulation mixer). The input signal supplied by the summing loop or the synthesizer (SMIQ-E) is applied to a power amplifier either via a harmonic filter or via a doubler with filter. A level control is provided there which keeps the output level of the board constant with CW mode. With vector-modulation mode, the LO level of the modulation mixer is thus kept constant.

The modulation mixer is followed by sophisticated filters in three frequency ranges, which suppress LO stereo separation and other mixer products. The filters are bypassed in the unmodulated mode, only with frequencies above 3 GHz mixing with 300 MHz and the filters are active.

The individual filter characteristics are stored in an onboard EEPROM. In the vector mode, the level frequency response is set by a control element according to a table. The associated calibration table is generated internally by comparing the level to the controlled output level with unmodulated operation and stored in the computer RAM (see section Calibration Routines).

The output signal with its frequency range 450 MHz (CW) or 750 MHz (VM) to 3.3 GHz feeds the IQ modulator module.

1.2.7 IQ Modulator (A240)

The IQ modulator contains the vector modulator or IQ modulator on the internal 300-MHz carrier frequency which is obtained by division from the 600-MHz auxiliary frequency of the reference/step synthesis module. The a.m. modulator is followed by an amplitude modulator with a switch for the ramp control and control elements for fast level control with level attenuation in the adjacent time slot or pulse modulation (burst modulator). A

high-resolution diagnosis rectifier and precise internal calibration voltages allow for an internal calibration of the vector modulator. The data are stored in the RAM of the computer (see section Calibration Routines). The 300-MHz signal is fed to the IQ-converter module for mixing.

Besides, the frequency range is extended here by mixing with a 2.4-GHz signal which is also generated onboard and synchronized with the 600-MHz auxiliary frequency of the reference/step synthesis board. Similar to the IQ converter, the level frequency response is set internally according to an internally generated calibration table the data of which are stored in the RAM of the computer (see section Calibration Routines).

Subsequently, the signal is amplified to the output level of the instrument. A linearized rectifier provides for an exact level which can be recalibrated using a power meter. The calibration table is written to the EEPROM of the computer and can be updated with module replacement or repair using the required equipment (see section Calibration Routines).

A synthesizer from 0.1 Hz to 1 MHz is provided as internal modulation source for the analog modulations (AM/FM/PhiM). The synthesizer signal is also provided at an output connector.

1.3 Test Instruments and Utilities

Item	Requirements	Instrument
1	Controller according to industry standard AT with remote control interface IEC-625/IEEE488 and serial interface RS232, connecting cable for RS232 and IEC bus	R&S PSM7 (1064.1004.70)
2	Board adaptor, software for diagnosis and calibration	Service Kit SM-Z3 (1085.2500.01)
3	RF power meter, 300kHz to 3.3 GHz	R&S NRVS (1020.1809.02) with power sensor NRV-Z51 (857.9004.02)
4	10-MHz frequency counter, calibrated	

1.4 Troubleshooting

1.4.1 Built-in Utilities, Servicekit

For self-monitoring and servicing purposes, internal test points are provided on all modules. The most important ones release an internal alarm via comparators when limit values are exceeded; all of them can be measured via multiplexer and an A/D converter on the controller board.

At least the onboard control voltages (also provided with alarm comparators) and the output levels can be internally measured on every module. In addition, test points are provided to support adjustments and enable measurements at places where an external measurement would cause problems (e.g. RF level in the module at interfaces to submodules). Mostly, these utilities are sufficient for identification of the damaged module.

The Service Kit SM-Z3 (Test Instruments and Utilities, pos. 2) contains extension boards and cables to put modules into an accessible servicing position. Furthermore a floppy disk is provided containing a diagnostic program, which performs a lot of module tests, diagrams and trimming routines to ease troubleshooting. Another program is provided for recalibration of the output level.

1.4.2 Selftest, Error Messages (ERROR)

If the control voltage exceeds the permissible range in a control loop, an alarm is released on the computer, which is indicated in the status line of the display. It may be caused by missing calibrations, wrong operation, exceeding of the specified parameters (above all in the case of the level) or internal faults.
The faults should be eliminated in the sequence given in the table below, since the faults listed further down may result from faults above.

Message in the display	Fault	Possible causes
172, Reference frequency 100MHz VCXO unlocked	The 100-MHz crystal oscillator on the module Reference/Step Synthesis (A7) is asynchronous.	External reference selected but not connected, wrong frequency of the external reference selected, external reference not in the permitted lock-in range, hardware error.
173, Step synthesis unlocked	The step synthesis on the module Reference/Step Synthesis (A7) is asynchronous.	Hardware error.
221, Digital synthesis buffer VCO unlocked	The buffer loop on the module Digital Synthesis (A8) is asynchronous. .	Hardware error.
130, FM modulator VCO unlocked	The modulation oscillator on the module FM Modulator (option) is asynchronous.	Heavy overload with external modulation. Hardware error.
211, Summing loop unlocked	The PLL on the Summing Loop module is asynchronous.	Missing or faulty calibration, e.g., after module replacement or at extreme temperatures (cf. Calibration Routines). Overload with external FM/PhiM. CAUTION ! After elimination of the overload, perform PRESET or a new calibration in order to synchronize the module again if repeated frequency changes lead to the error message again! Hardware error which often results from faults on the Digital Synthesis or Step Synthesis.
222, Synthesizer loop unlocked	The control loop of the output oscillators, the 600-MHz oscillator or the 10-MHz VTCXO on the Synthesizer modules asynchronous (SMIQ-E). All of the 3 interrupts are ORed to one interrupt, the asynchronous PLL can be determined via the diagnosis, see below)	External reference selected but not connected, wrong frequency of the external reference selected, external reference not in the permitted lock-in range. Missing or faulty calibration of the Preset voltage (cf. Calibration Routines). Hardware error.

Message in the display	Fault	Possible causes
110, Output unleveled; ALC Failure	The level control for the output level on the IQ-modulator module does not work correctly.	Level outside the specified range. Overload with AM-EXT-DC. Missing or faulty calibration, e.g., after module replacement or at extreme temperatures (cf. Calibration Routines). Hardware error.
111, IQCON: ALC loop failure	The local level control on the IQ-converter module does not work correctly.	Hardware error.
224, 2.4 GHz LO loop unlocked	The VCO for the output mixer on the IQ-modulator board is not synchronized.	Hardware error.

1.4.3 Internal Diagnosis

Since the voltage range of the multiplexers is limited to ± 5 V, voltage dividers are required at many test points. However, the original voltage is to be indicated in the display so that every test point has its associated scaling factor. The full measured value before the voltage divider is displayed.

For further fault location, the following test points can be selected, the specified voltages are approximate values for properly functioning instruments. They are indicated on the display and can also be read out by a controller via the IEC-625 interface.

1.4.4 List of Diagnostic Points

The table contains the voltages which may occur in the case of a functioning instrument. Some of the test points require the corresponding function to be activated on in order to obtain the table values. An X in the column IR means that the test point releases an alarm. Df is the divider factor before the multiplexer.

Module	T-point	Test	*	min/V	max/V	Df
FRO	0	Reference 1kOhm		-0.05	0.05	
	1	Input DIAG-15		-15	15	
	2	Input DIAG-5		-5	5	
	3	X-voltage		0	10	
	4	not used				
	5	Programming voltage EEPROM		0	5.5	
	6	Reference voltage X-D/A converter		4.9	5.1	
	7	Battery voltage		2.2	3.8	

Module	T-point	Test	*	min/V	max/V	Df
ROSC	100	Reference 10kOhm		-0.01	0.01	1
	101	Bridge voltage thermostat (VAR06, only)	x	5.6	6.4	3
	102	Output level		0.6	3	1
REFSS	200	Reference 10kOhm		-0.01	0.01	1
	201	Tuning voltageVCXO 100MHz	x	2	12	4
	202	DAC tuning 10-MHz reference		-10	0	4
	203	Level 1-MHz reference		1.8	2.5	1
	204	Level divider output 1MHz		2	3	1
	205	Level external reference		0.8	3.5	1
	206	Level 300-MHz IF		0.1	0.4	1
	207	Level Output REF50		0.3	1.3	1
	208	Frequency detector		-0.04	0.04	4
	209	Level Output REF100		0.15	1.2	1
	210	Level Output REF600		0.15	0.6	1
	211	+24-V supply		22.5	25.5	8
	212	Tuning voltage STEP-VCO	x	1	21	6
	213	Level Step divider		0.4	2.5	1
	214	Level Step IF (3 to 17 MHz)		0.1	0.25	1
	215	Level Output FSTEP		0.2	0.6	1
DSYN	300	+15-V supply		14	16	4
	303	Clock for DDS-GA		0.5	1.5	1
	304	Output level FDSYN		0.05	0.2	1
	305	Tuning voltage buffer VCO off		-5	24	5
		Tuning voltage buffer VCO on		1.5	21.5	5
	306	-15-V supply		-14	-16	4
	307	7.5-V supply		7	8	2
TSYN	400	Reference 10kOhm		-.01	.01	1
	401	Tuning voltage VTCXO 10MHz	x	0	5	3
	402	Level 10-MHz reference		1.5	4	1
	403	Level 600-MHz VCO		.05	.3	1
	404	Tuning voltage 600-MHz VCO	x	2	20	5
	405	Output level REF600		.1	.5	1
	406	Output level REF50		.4	2	1
	407	Level Synthesis VCO		.01	.15	1
	408	Output level FSYN		.04	.4	1
	409	Output voltage PI control	x	-5	5	3
	410	Level 1-kHz detector		-.01	.15	3
	411	Tuning voltage Synthesis VCO		2	20	5
	412	Internal +10-V supply		9.7	10.3	3
	413	free				
	414	Voltage FM1+FM2		-12	12	3
	415	Output voltage FM-DC control		0.5	4.5	1
FMOD	500	Reference 10 kOhm		-0.01	0.01	1
	501	Tuning voltage VCO	x	2.7	12.3	3
	502	Level VCO		0.1	0.4	1
	503	LO level 1st mixer		0.1	0.4	1
	504	Output level FDFM		0.1	0.6	1
	505	Modulation voltage		-4	4	3

Module	T-point	Test	*	min/V	max/V	Df
SUM	600	PLL differential voltage		-0.6	0.6	2
	601	IF level		0.18	0.28	1
	602	RF level at sampler		0.01	0.15	1
	603	Pulse amplitude		1	3	1
	604	Output level FSUM		0.06	0.4	1
	605	VCO level		0.02	0.3	1
	605	VCO tuning voltage	x	0	22	5
	607	VCO preset		0	22	5
ATTC	1100	Overvoltage protection		-5	-3	1
IQCON	2000	Reference 10kOhm		-0.01	0.01	1
	2001	Internal -10V		-10.2	9.8	3
	2002	Level Preset		2.5	6	5
	2003	Tuning voltage owfil		0	22	5
	2004	Tuning voltage vdfil		0	22	5
	2005	Tuning voltage iqfil1		0	22	5
	2006	Tuning voltage iqfil2		0	22	5
	2007	Tuning voltage iqfil3		0	22	5
	2008	Internal ref4		3.9	4.1	1
	2009	Internal ref6		6.4	6.6	2
	2010	Internal ref10		9.8	10.2	3
	2011	Level owfil		0	0.6	1
	2012	Level vdfil		0	0.6	1
	2013	Local ALC	x	0	12	3
	2014	Input level iqfil		0.1	0.6	1
	2015	Output level iqcon		0.1	0.6	3
IQMOD	2100	Reference 10kOhm		-0.01	0.01	1
	2101	Internal ref10		9.8	10.2	3
	2102	Output LF generator		-1	1	3
	2103	Level ref600		0.1	0.5	1
	2104	Tuning voltage 2.4-GHz VCO	x	0	22	5
	2105	Level 2.4 GHz oscillator		0.1	0.3	1
	2106	Level at phi600		0.1	0.3	1
	2107	LO level 2.4 GHz		0.1	0.3	1
	2108	Level Preset		2.4	6	3
	2109	ALC voltage	x	0.1	14	3
	2110	Level command value		-6	0	3
	2111	Level IF		0	0.3	1
	2112	Level AM modulator		0	0.5	1
	2113	Detector voltage		0	6	3
	2114	Level ref300		0.5	1.5	1
	2115	Level iqout		0	0.3	1
	2116	Level inp. I		-0.5	0.5	2
	2117	Level inp. Q		-0.5	0.5	2
	2118	LO level I		0	0.5	1
	2119	LO level Q		0	0.5	1
	2120	Phase control voltage		3.5	13	3
	2121	300-MHz calibration detector		0	10	3
	2122	Power ramp		-3	0	3
	2123	Control voltage lev. att.		-3	0	3

Module	T-point	Test	*	min/V	max/V	Df
MCOD	2200	Reference 10kOhm		-0.01	0.01	1
	2201	Tuning voltage VCO	x	0	20	5
	2202	Signal out_i		0	1.1	1
	2203	Signal out_q		0	1.1	1
	2204	Signal out_burst		0	4.5	3
	2205	VCO level		0	0.5	1
	2206	+5-VA supply		4.8	5.3	2
	2207	-5-VD supply		-5.3	-4.8	2
DGEN	2300	Battery voltage		2.0	3.8	1
FSIM1	2500	+3.3V supply		3.1	3.5	1
	2501	I-output		0	1	1
	2502	Q-output		0	1	1
	2503	Clock generator supply		4.7	5.3	2
	2504	Digital module supply		4.9	5.5	2
	2505	Ground		-.01	.01	1
	2506	Ground		-.01	.01	1
	2507	Ground		-.01	.01	1
FSIM2	2600	+3.3V supply		3.1	3.5	1
	2601	I-output		0	1	1
	2602	Q-output		0	1	1
	2603	Clock generator supply		4.7	5.3	2
	2604	Digital module supply		4.9	5.5	2
	2605	Ground		-.01	.01	1
	2606	Ground		-.01	.01	1
	2607	Ground		-.01	.01	1

1.4.5 Testing the Modules with the Built-in Diagnosis

The diagnosis is activated in the menu UTILITIES/DIAG/TPOINT/STATE with ON. TPOINT permits to select the desired test point via rollkey or keyboard.

1.4.5.1 Troubleshooting with Respect to Modules

Before performing the specified settings on the SMIQ, the instrument should be set to a defined initial status by means of PRESET. Diagnostic test points which are not referred to in the following must lie inside the given limits irrespective of the settings. Particularly the internal supply voltages should be the first to be checked.

These simple tests are intended to allow for determination of a faulty module, more detailed tests can be looked up in the service instructions of the modules.

Most of the following tests and many more can be performed automatically using the **diagnostic program of the Service Kit SM-Z3**. This program additionally offers an overall test, wherein all modules are checked in order of signal flow. Defects so are listed in that order, they should get repaired to prevent unneccesary troubleshooting on secondary defects.

1.4.5.1.1 A3 Front Module, Diagnostic Test

If the instrument does not respond to inputs via rollkey or keyboard although the display shows readings, first check whether the instrument is disabled by the remote control (IEC bus) or whether a key got stuck. If this is not the case, see service instructions for the module A3.

Test points 0 to 7 are to be found on the computer.
Test point 0 is applied to digital ground, measuring the voltage drop of this ground with respect to the analog ground. Test point 2 is not used with the SMIQ. Test point 3 indicates the input voltage of the diagnostic A/D converter.

• For testing the diagnosis, select TPOINT 3 and apply a voltage V with -5 V < V < +5 V to pin 19 of the motherboard plug of a module.

➢ The voltage applied to pin 19 must be read out on the display. The deviation must be <1 % ±50 mV.

Test point 6 measures the voltage for the output socket X-AXIS at the rear.

• Set any sweep with approx. 100 steps on the SMIQ. Vary from the lower to the upper sweep limit in the operating mode MAN and observe the indicated voltage.

➢ It must vary from 0 to 10 V proportionally to the sweep steps.

Test point 7 measures the voltage of the battery supplying the non-volatile memories (RAM). If the voltage drops below 2.2 V, the data will no longer remain saved after switching off.

1.4.5.1.2 A2 Power Supply

The power supply features an independent self-monitoring facility, switching to standby mode in the case of overload or internal disturbances (LED on the front panel).

• Test points 211, 300, 306 and 307 permit to perform measurements on the modules for checking whether the supply voltage are properly applied (not SMIQ-E).

1.4.5.1.3 Reference/Step Synthesis

Proper functioning of the step synthesis over its frequency range can be checked as follows:

• Vary the frequency from 840 to 942 MHz on the SMIQ. In this frequency range, nearly all steps of the step synthesis are swept through.

➢ The tuning voltage of the step VCO at test point 212 must increase continuously from approx. 2 V to approx. 18 V.

1.4.5.1.4 A7 Digital Synthesis

Functioning of the buffer loop can be checked as follows:

• Vary the frequency (unmodulated) on the SMIQ from 1350.2 to 1351.4 MHz. Thus the setting range of the digital synthesis is fully swept through.

➢ The tuning voltage of the buffer VCO at TPOINT 305 must continuously increase from approx. 14.6 to approx. 18 V.

1.4.5.1.5 A6 FM Modulator (Option)

The built-in modulator allows for tracing the signal path of FM as far as to the modulator.

• To this end, select **MODULATION/FM/FM2 SOURCE INT**, **DEVIATION** 500kHz at an RF of 1000 MHz and **LFGEN FREQUENCY** 0.2Hz.

➢ Am TPOINT 505 soll die Anzeige von ca+1.5V bis ca. -1.5V variieren.

1.4.5.1.6 A9 Summing Loop

Correct synchronization of the two oscillators can be checked as follows:

• Vary the carrier frequency (unmodulated) on the SMIQ from 750.0000001 to 1100 MHz. Thus, the complete tuning range of the first oscillator is covered.

➢ The voltage at test points 606 and 607 must continuously increase from 2 ±0.5 to 19 ±2 V. It must not exceed ±600 mV at test point 600.

The second oscillator features an inverted tuning characteristic.

• Vary the carrier frequency (unmodulated) on the SMIQ from 1100.0000001 to 1500 MHz. Thus, the complete tuning range of the second oscillator is covered.

➢ The voltage at test points 606 and 607 must continuously decrease from 19 ± 1V to 2 ±1 V. It must not exceed ±600 mV at test point 600.

In the case of faulty functioning, in particular in the upper frequency range of both oscillators, the calibration might be faulty. For recalibration, see Calibration Routines.

1.4.5.1.7 Synthesizer TSYN (SMIQ-E)

The PLL function of the 10-MHz VTCXO can be checked as follows:

• Switch to external reference in the **UTILITIES/REF OSC/SOURCE EXT** menu. Feed 10 MHz, 0 dBm to the BNC connector REF on the rear using a signal generator, vary the frequency ± 30Hz.

➢ The voltage at TPOINT 401 must be in the range from 0.5 to 4.5V

Correct synchronization of the three output oscillators can be checked as described below:

• Vary the carrier frequency (unmodulated) on the SMT from 750.0000001 to 1000 MHz, 1000.0000001 to 1250 MHz and from 1250.0000001 to 1500 MHz. Thus, the complete tuning range of the three oscillators is covered.

➢ The voltage at TPOINT 411 must increase continuously in each tuning range from 2.7±0.5 to 19±2V. The voltage at test point 409 must not exceed ±1V. If it does, the calibration of the preset voltage may be faulty (see Calibration Routines).

The signal path of the FM in the modulation attenuator may be traced as follows:

• To this end, select **MODULATION/FM/FM1 SOURCE INT/ DEVIATION** 10kHz at an RF of 1000 MHz and **LFGEN FREQUENCY** 0.1Hz.

➢ At TPOINT 414 the readout must change from approx. +5 V to approx. -5V

• Similar to the signal path, the function of the FMDC control can be checked:

➢ At TPOINT 415 the readout must change from approx. +1.8V to approx. 3.2V

1.4.5.1.8 IQ Converter

• Generation of the tuning voltages for the various filters can be checked according to the table below. The tuning voltages must vary continuously between the interpolation points.

Carrier frequency in MHz	Modulation	Diagnostic point	Filter	Rated voltage in V
500	CW	2003	owfil	3
750				6.5
1000				11.5
1200				21
1500				21
1500.1		2004	vdfil	0
1750				3
2000				6
2250				9
2500				15
2700				20
2750 to 3000				21
800	VM	2005	iqfil1	3
1000				4
1200				5.5
1400				7
1600				10

Carrier frequency in MHz	Modulation	Diagnostic point	Filter	Rated voltage in V
1799.9				11
1800.1				0.5
2000				5
2200				10
2400				16
2499.9				20
2500.1				6
2800				8
3000				10
3200				13
3300				15
800	VM	2006	iqfil2	3
1000				4.5
1200				6
1400				7.5
1600				10
1799.9				15
1800.1				6
2000				8
2200				9.5
2400				14
2499.9				18
2500.1				5.5
2800				7
3000				10
3200				14
3300				18
800	VM	2007	iqfil3	0
1000				4
1200				5
1400				6.7
1600				10
1799.9				16
1800.1				1.5
2000				4.5
2200				6.5
2400				10
2499.9				13
2500.1				2
2800				5
3000				8
3200				11
3300				13

Level measurements

- Preferably start tracing the level in CW mode.

Carrier frequency in MHz	Modulation	Diagnostic point	Measurement	Rated voltage in V
450.1 to 1499.9	CW	2011	owfil	>.03
1500.1 to 3000	CW	2012	vdfil	>.03
450.1 to 3000	CW	2013	Local ALC	<12
450.1 to 3000	CW	2015	Output level	0.2 to 0.3

• Subsequently, trace levels in IQ mode.
➢ It is therefore required to apply 0.50V dc to the I or Q input.

Carrier frequency in MHz	Modulation	Diagnostic point	Measurement	Rated voltage in V
750.1 to 3300	VM	2014	Input iqfil	>.03
750.1 to 3300	VM	2013	Local ALC	<12
750.1 to 3300	VM	2015	Output level	0.15 to 0.4

1.4.5.1.9 IQ Modulator

• Level command value

➢ Settings on SMIQ: level 7 dBm, internal AM featuring 0% modulation depth, switch off level correction (CALIB/LEVEL/USAGE OFF).

➢ A voltage from -1.5+-0.1V shall be measured at diagnostic test point 2110.

➢ If the LF generator is set to 0.1 Hz and the modulation depth is increased to 100%, the voltage must change between 0 and -3 V.

RF Level
• The level is traced with 16 dBm, unmodulated.

Carrier frequency in MHz	Modulation	Diagnostic point	Measurement	Rated voltage in V
450.1 to 3300	CW	2112	acc. to ALC element	>.03
400	CW	2107	2.4-GHz LO level	>0.1
100 to 450	CW	2111	IF level	>0.03

Testing the modulator
• If the calibration of the modulator fails (cf. Calibration Routines), check the following levels:

Carrier frequency in MHz	Modulation	Diagnostic point	Measurement	Rated voltage in V
3300	CW	2114	300-MHz level	>0.5
		2118	LO level I	>0.2
		2119	LO level Q	>0.2
		2115	Level to modulator	>.03

• If calibration of the modulator is successful (cf. Calibration Routines), test only the last point given in the table.

1.4.6 Troubleshooting to Type of Error

Depending on the type of error, the sequence of the modules that may have caused the fault is listed in the following according to the signal flow

Type of Error	Troubleshooting Sequence
Frequency error	Reference oscillator OCXO (option) Reference/Step synthesis Digital Synthesis Summing loop Synthesizer (SMIQ-E) IQ converter IQ modulator
Level error	Summing loop Synthesizer (SMIQ-E) IQ converter IQ modulator Attenuator
AM error	IQ modulator
FM/PhiM error	Reference/Step synthesis (mixed frequency 100MHz) Frequency modulator Summing loop (error with high deviations and modulation frequencies) Synthesizer (SMIQ-E)
Harmonic level too high	IQ converter IQ modulator
Insufficient spectral purity (SSB noise, unwanted deviation)	If this error occurs in the unmodulated state, see Frequency error; only with FM/PhiM see FM/PhiM error.

1.5 Calibration, Password Protection

The diagnosis program in the service SM-Z3 provides a menu item which allows for performing all internal calibration.

For troublefree and safe operation of the instrument, valid calibration values are required for various functions.

Calibration values which can be generated by the instrument itself are kept in the battery-backed RAM of the computer. These values are protected against accicentally overwriting by a password (level 1).

Unlocking password protection is described in the operating manual.

Values which can only be determined using external measuring equipment are written into the flash EPROM (level correction and tuning voltage of reference oscillator). These data are protected by password level 3 or 2.

Since the flash EPROM does not permit single data to be deleted, new memory space is used for each calibration.
If no more memory area is available, the EPROM must be cleared and newly written to by a R&S service department. Calibrations like this should only be performed if required.

Operational data (operating time, attenuator switch count etc.) are protected by password level 3.

1.5.1 Calibration Routines

1.5.1.1 Calibration of Summing Loop Pretune Voltage

CAUTION!!
The summing loop cannot synchronize without valid calibration of the pretune voltage! This routine must be called up after an adjustment or module replacement.

- Perform calibration as described in the operating manual.

➢**The instrument should have warmed up to normal operating temperature. If the cold instrument has to be calibrated to be started up, the calibration must be repeated at normal operating temperature.**

➢ **This calibration must be performed prior to any other calibration!**

Results of the calibration can be checked by selecting VIEW. Typical values for the offset (in the first column after the frequency) are up to +-200mV, preset values in the second column typically raise from about 90 up to about 240 at 1100MHz and fall down again to about 90 at 1500MHz. The third column shows values representing tuning sensitivity in the range from 0 to 7.

The calibration data are stored in the RAM and can be updated as often as desired.

1.5.1.2 Calibration of Synthesizer (SMIQ-E)

a) Calibration of the synthesizer pretune voltage

CAUTION !!
The synthesizer may not synchronize without valid calibration of the pretune voltage! This routine must be called up after an adjustment or module replacement.

- Perform the calibration as described in the operating manual.

➢ **The instrument should have warmed up to normal operating temperature. If the cold instrument has to be calibrated to be started up, the calibration must be repeated at normal operating temperature.**

➢ **This calibration must be performed prior to any other calibration!**

The calibration data are stored in the RAM and can be updated as often as desired.

b)Calibration of FM on the synthesizer module

The tuning slope of the output oscillators is determined by calibration to provide for correct FM setting.

CAUTION !!
With the calibration table being missing or faulty the FM characteristics deteriorate (frequency response), high deviations may even lead to large distortion.

The calibration must be always performed with replacement of the computer or after repair or replacement of the synthesizer. The frequency generation must work correctly and the synthesizer, in particular, must be calibrated (see above).

Moreover, the calibration must be repeated with any changes of temperature >5 degrees and required data security with stereo separation.

- Perform the calibration according to the operating manual.

➢ **The instrument should have warmed up to normal operating temperature. If the cold instrument has to be calibrated to be started up, the calibration must be repeated at normal operating temperature.**

1.5.1.3 Calibration of the Vector Modulator

Optimum modulation data of this modulator are obtained by internal calibration.

- Perform the calibration according to the operating manual.

➢ **The instrument should have warmed up to normal operating temperature. If the cold instrument has to be calibrated to be started up, the calibration must be repeated at normal operating temperature.**

The calibration data are stored in the **RAM** and can be updated **as often as desired**.

1.5.1.4 Calibration of Level Preset

The individual level preset of the instrument permits the level control to be operated in its optimal operating point.

CAUTION!!
If the calibration table is missing or faulty, the AM characteristics become worse, in the extreme case the set level is not reached and failure message "110 Output unleveled; ALC Failure" is displayed.

The calibration must always be performed when the Front Module has been replaced or modules starting from the summing loop have been repaired or replaced. The frequency generation must work properly, the summing loop, in particular, must be calibrated (see above).

- Perform the calibration according to the operating manual.

➢ **The instrument should have warmed up to normal operating temperature. If the cold instrument has to be calibrated to be started up, the calibration must be repeated at normal operating temperature.**

Results of the calibration can be checked by selecting **VIEW**. Typical values range from 16 to 50. Some values at high output levels may be higher.

The calibration data are stored in the **RAM** and can be updated **as often as desired.**

1.5.1.5 Output Level Correction

The accuracy of the output level is obtained by means of a level correction according to a table stored in the computer. The table is generated using a test program and a calibrated power meter and transferred into the EPROM of the computer.

This calibration must be repeated after replacement of the computer and after replacement or repair of the IQ-modulator or attenuator modules.

The following instruments and utilities are required:

- controller (Test Instruments and Utilities, item 1).
- program floppy disk (Test Instruments and Utilities, item 2).
- Power meter (Test Instruments and Utilities, item 3).
- To execute the program-controlled calibration please refer to the manual of the service kit (Test Instruments and Utilities, item 2)

1.5.1.6 Reset Attenuator Counter

When fitting a new attenuator, the counter in menue UTILITIES/DIAG/PARAM is to be reset. The counter is protected by password level 3. Unlocking is described in the operating manual. Please contact your local R&S representative to get the password. After unlocking menue UTILITIES/DIAG/SET PARAM appears, which allows switch counts to be reset.

1.5.1.7 Calibration of the Reference Frequency

If the option SM-B1, reference oscillator OCXO is not fitted to the instrument, the reference oscillator on the reference/step-synthesis module or the one on the synthesizer module (SMIQ-E)

must be recalibrated with module replacement or advanced ageing.

➢ **The instrument should have warmed up to normal operating temperature.**

• Set UTILITIES/PROTECT LOCK LEVEL 2 to OFF by entering the pass word 250751.

• Connect calibrated frequency counter (Test Instruments and Utilities, item 4) to the REF connector on the rear panel and measure the output frequency.

• Select **UTILITIES/CALIB REF OSC.** Select CALIBRATION DATA and vary the rollkey until reaching the rated frequency 10.000000 MHz. The new setting value is written to the EPROM by selecting **STORE CALIBRATION DATA**.

CAUTION!! This procedure can only be performed as long as the EPROM provides sufficient storage capacity. Otherwise, the flash EPROM has to be reprogrammed by an R&S service department.

If the SM-B1 option, reference oscillator OCXO is fitted, the calibration data have to be transferred to the EEPROM of the computer with replacement of the option or advanced ageing. Refer to the service instructions of the option.

1.5.2 Adjustments of Complete Instrument

If the instrument is composed of modules which are tested and adjusted according to the corresponding service instructions, only the calibrations listed in section Calibration Routines need be performed.

1.5.3 Adjustments on Module Replacement

Replacement of module	Required adjustments
Front unit	all
Option SM-B1, reference oscillator OCXO	Calibration of the reference frequency
Reference/step synthesis	Calibration of the reference frequency
Digital synthesis	none
Summing loop	Calibration of the pretune voltage of the summing loop, calibration of level preset
Synthesizer (SMIQ-E)	Calibration of the synthesizer Calibration of level preset
IQ converter	Calibration of level preset
IQ modulator	Calibration of the vector modulator Calibration of level preset, output level correction
Attenuator	Output level correction Reset of attenuator counter

1.6 Removal and Assembly

CAUTION !!! *Switch off the instrument and pull the power plug prior to removal*

1.6.1 Replacing the Panelling

- Loosen four screws in the rear-panel feet and remove the feet.

➢The upper panelling can then be lifted towards the rear and the top.

- Place the instrument upside down in order to remove the lower panelling.

Before fitting the panelling first check whether the modules are locked and lock them, if necessary.

- Place the instrument onto a side edge and insert the lower panelling first. Make sure that the sealing cords are correctly placed in their grooves.

- Place the instrument in the horizontal position and insert the upper panelling.

Make sure with both panellings that the guide lugs on the rear panel engage into the grooves of the panellings

- Fasten the feet with screws.

1.6.2 Replacing a Plug-in Module

- Remove panelling (see above).

- Place the instrument onto a side edge.

Before removing a module, the common lock of the modules must be loosened.

- For this purpose, loosen the two screws in the elongated holes on every locking rail. The rail in question can then be pushed to the front using a screw-driver (slotted-type) at the points marked by the screw-driver symbol.

- Take off or unscrew the RF cables.

➢ The module can then be removed.

For replacement, proceed in the reverse order.

1.6.3 Replacing the Front Module

• Loosen four screws in the feet on the rear panel and take off the feet.

• Carefully take out the front module until the flat cable connectors can be removed from the front module.

• Loosen the lock of the big flat cable plug at the front edge of the motherboard and disconnect the plug.

➢ The front module can then be removed.

When replacing the module in the reverse order make sure that no flat cables get stuck.

1.6.4 Replacing the Power Supply

• Loosen four screws in the feet on the rear panel and take off the feet.

• Unscrew six screws (marked by milling of their contact surface) at the edge of the right-hand sheet of the rear panel and two screws on the joint of the two rear panel sheets.

The power supply is directly plugged to the motherboard and can then be removed.

For replacement, proceed in the reverse order.

1.7 External Interfaces

Entry in column D (direction): **O** = Output **I** = Input **B** = Bidirectional
Entry in column T (type): **A** = Analog **D** = Digital **P** = Power
Entry in column TI (test instructions) **P** = Test value **T** = Trimming value **D** = Type test value **E** = Setting value

S i g n a l name	D	T	Range	T I	Contact	Remark
RF output RF Output	O	A	300kHz to 3.3GHz	P	X206	
DATA	B	D		P	X207	
BIT CLOCK	B	D		P	X208	
SYMBOL CLOCK	B	D		P	X209	
I (BB-AM)	B	A	DC to 30MHz	P	X244	
Q	B	A	DC to 30MHz	P	X245	
RF	O	A	300kHz to 3.3GHz	P	X206	optional
LF	O	A	.1Hz to 1MHz	P	X401	
REF	B	A	1MHz to 16MHz	P	X73	
EXT1	I	A	DC to 2MHz	P	X402	
EXT2	I	A	DC to 10MHz	P	X403	
DATA	B	D		P	X207	optional
BIT CLK	B	D		P	X208	optional
SYM CLK	B	D		P	X209	optional
POW RAMP	B	A		P	X243	
PAR.DATA	B	D		P	X203	optional
SER.DATA	B	D		P	X341	optional
AUX. IN/OUT	B	D A		P	X400	
RS232	B	D		P	X313	
IEC625/IEEE488	B	D		P	X314	

The input and output signals are described in detail in the data sheet of the instrument (refer to operating manual).

ROHDE&SCHWARZ

Liste mechanischer Teile
Bilder und Erklärung zur Liste mechanischer Teile

List of mechanical parts
Figures and explanation pertaining to list of mechanical parts

Liste des pièces mécaniques
Figures et définitions pour la liste des pièces mécaniques

095.1000 Bl. 13

Liste mechanischer Teile

Der SMIQ ist in ***R&S-Kompaktbauweise 90*** aufgebaut.

Gehäusegröße:
4 E, 1 / 1 , T 460

Maße über alles:
450 x 192 x 460 (B × H × T)

Ergänzungen:
19"-Adapter ZZA

Tragegriff, Nachrüstsatz
(falls ein zweiter Tragegriff gewünscht wird)

List of mechanical parts

The SMIQ is designed in accordance with the ***R&S design 90***.

Cabinet size:
4 E, 1 / 1 , T 460

Overall dimensions:
450 x 192 x 460 (width × height × depth)

Accessories:
19"-Adapter ZZA

Carrying handle, retrofit set
(if a second carrying handle is desired)

Lfd. Nr.	Kenn-zeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/ Comp.No	Qty	Designation	Stock No.
1		1	Haube, oben 4 E, 1 / 1 , T 460 Cover, top	819.0426
2		1	Haube, unten 4 E, 1 / 1 , T 460 Cover, bottom	396.7910
3		1	Führungsschiene, rechts Guide rail, right	—
4		1	Führungsschiene, links Guide rail, left	—
5		1	Bedienhinweiskarte 1 User guide card 1	—
6		1	Bedienhinweiskarte 2 User guide card 2	—
7		1	Bedienhinweiskarte 3 User guide card 3	—
8		2	Gerätefuß, vorne Instrument foot, front	396.4534
9		2	Aufstellfuß, unten Foot, bottom	396.4540
11		2	Gerätefuß, hinten Instrument foot, rear	396.4586
12		8	Zapfen Pin	396.4634
15		2	Seitenleiste T 460 Side strip	396.3080

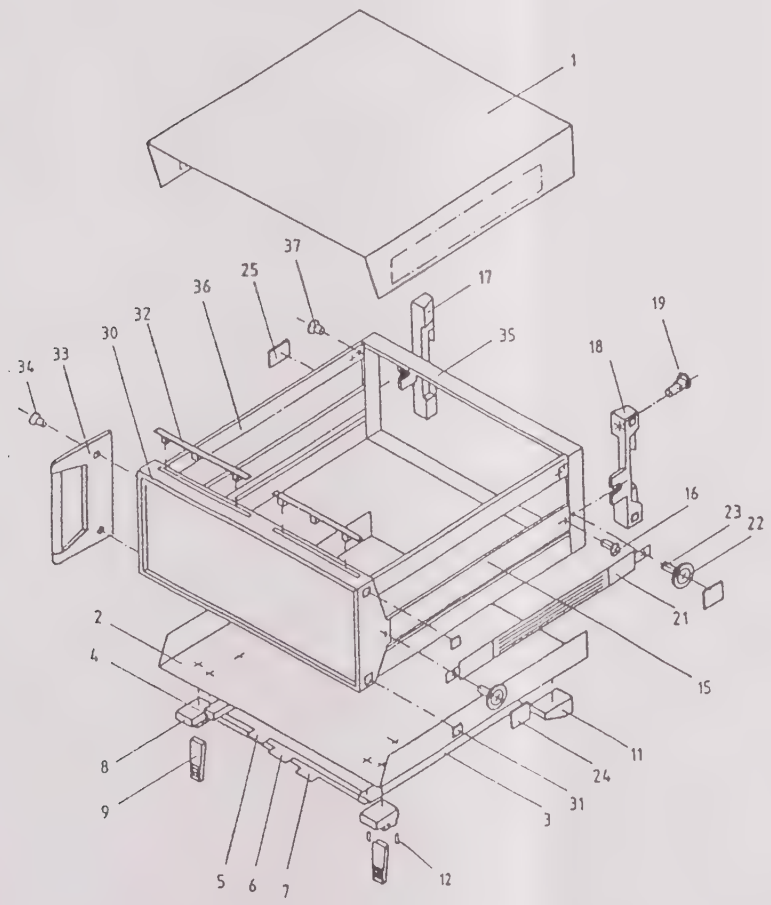
Lfd. Nr.	Kenn-zeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/ Comp.No	Qty	Designation	Stock No.
16		4	M3×6 DIN965 A4	081.9378
17		1	Rückwandfuß, links 4 E Rear-panel foot, left	396.4363
18		1	Rückwandfuß, rechts 4 E Rear-panel foot, right	396.4157
19		4	Ansatzschr. M4 K.D 7985 Screw	396.4492
21		1	Tragegriff T 460 Carrying handle	396.3221
22		2	Griffbuchse Washer	396.3367
23		2	M4×10 DIN965 A4	081.9478
24		2	Abdeckung, Griffseite Cover, handle side	396.3350
25		2	Abdeckung, Leerseite Cover, blank side	396.3344
30		1	Frontrahmen 4 E 1 / 1 Front frame	396.2131
31		4	Seitenfuß Side foot	396.4692
32		2	Stapelnutabdeckung Cover for groove	396.4711
33		2	Frontgriff Front grip	—
34		4	M4×8 DIN965	396.1087
35		1	Rückrahmen 4 E 1 / 1 Rear frame	396.2277
36		4	Rahmenschiene T 460 Frame rail	396.2377
37		16	M3×8 DIN965 A4	081.9384
40		1.17 M	HF-Dichtschnur O-Prof. 2,7 SI RF seal	396.0916
41		3.22 M	WG HF-Dicht. O-Prof. 2,0 SI RF seal	396.1035

Gehäuse

Aufbau

Der Aufbau besteht aus einer tragenden Aluminium-Druckguß-Rahmenkonstruktion mit gerätespezifischer Front-, Montage- und Rückplatte, die mit einer Ober- und Unterhaube (= Beplankung) ummantelt ist.

Rahmen und Beplankung:



Casing

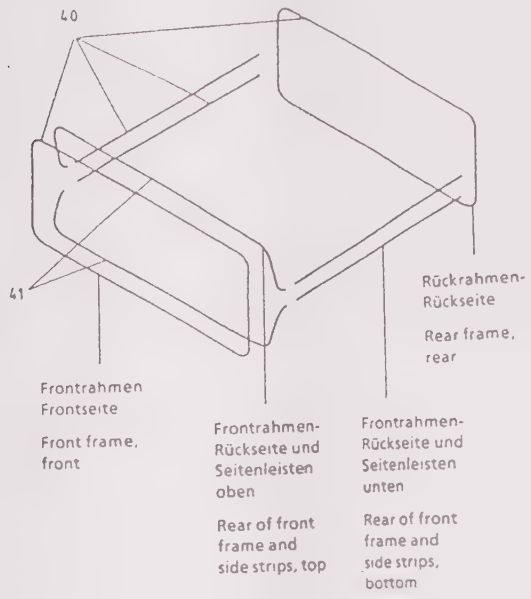
Construction

The construction consists of a self-supporting aluminium-cast frame with front, mounting and rear panel, top and bottom covers (= panelling).

Frame and panelling:

Dichtschnur (nur bei Geräten mit erhöhtem Schirmdämpfungsbedarf vorhanden) jeweils in die umlaufende Nut einlegen.

Insert the braided cord (provided only for instruments requiring a high degree of shielding) into the respective groove.



Die Dichtschnüre in der Frontrahmen-Frontseite und in der Rückrahmen-Rückseite müssen durch Klebepunkte in Abständen von ca. 80 mm fixiert werden. Dazu Klebepunkte mit ca. ø2 mm im Nutgrund anbringen und Dichtschnur aufdrücken.
Dauerhaft elastischen Kleber wie z.B. Si-Kautschuk 3145 RTV (R&S-Sachnr. WV 088.3152) verwenden.

Bei Geräten mit geteilten Rückplatten müssen beim Zusammenbau die Einzelelemente über die gesamte Gehäusebreite waagerecht zueinander ausgerichtet werden.
Ober- und Unterhaube müssen mit den Erhöhungen am Rückrahmen fixiert sein.

Achtung: bei hohen Rückwandfüßen (CMS) werden die Fixier-Erhöhungen verdeckt, hier Rückwandfüße erst anschrauben, wenn die Ober- u. Unterkante sicher in den Erhöhungen am Rückrahmen fixiert sind.

The braided cords in the front of front frame and rear of rear frame must be fixed by glued joints approx. every 80 mm. Make joints (ø approx. 2 mm) on the bottom of the groove and press braided cord firmly on it.

Use a permanently elastic adhesive, such as Si-rubber 3145 RTV (R&S Part No. WV 088.3152).

Instruments with separate rear panels require the individual components to be adjusted to the same level over the complete instrument width.
Top and bottom cover must be fastened by way of the catches on rear frame.

Note that with high rear panel feet (CMS) the catches are concealed; here tighten the rear feet screws only after the top and bottom cover have been securely fitted into the catches.

Öffnen und Schließen des Gehäuses

Die gute Schirmdämpfung der Kompaktbauweise 90 erfordert häufige Kontaktstellen und hohe Paßgenauigkeit. In Verbindung mit einem leichten Anlagedruck, der mit dem Festziehen der Rückwandfußschrauben erreicht wird, erhält man einen straffen Sitz der Ober- und Unterhaube auf dem Rahmen.

Zum *Öffnen* muß man die Rückwandfußverschraubung lösen und die Füße nach rückwärts abziehen (Schrauben bleiben im Fuß haften). Je nach Bedarf läßt sich nun Ober- bzw. Unterhaube ebenfalls nach rückwärts abnehmen. Sitzen die Hauben sehr fest, erleichtert man das Abziehen durch abwechselndes Hebeln in Pfeilrichtung mit einem Schraubenzieher an beiden Geräteseiten (siehe Bild).

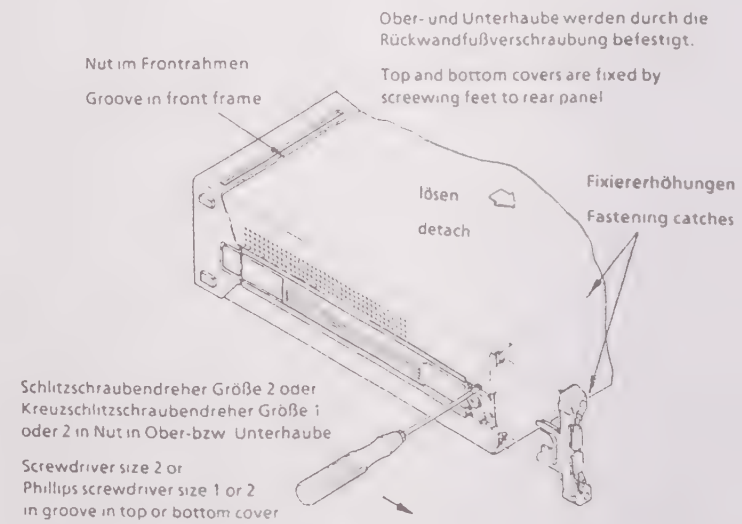
Zum *Schließen* des Gehäuses werden erst die Frontkanten der Hauben in die umlaufende Nut des Frontrahmens und der Seitenleisten eingeführt und dann in die Erhöhungen am Rückrahmen bis Anschlag eingerastet. Das Gerät ist wieder geschlossen, wenn die Rückwandfüße eingeschoben und die Schrauben festgezogen sind.

Opening and closing the cabinet

To obtain the high degree of shielding of design 90, many points of contact and accurate fitting are employed. When exerting a slight pressure by tightening the rear-panel feet, tight fitting of the top and bottom covers is ensured.

To *open* the cabinet, first undo the rear panel feet screws and withdraw the feet (captive screws). It is now possible to detach top and bottom cover if required. If the fitting of these cover plates is very tight, removal can be facilitated by alternately levering on both sides of the instrument using a screwdriver (see illustration).

To *close* the cabinet, insert the front edges of the covers into the groove of the front frame and the side strips and lock them into the catches on the rear frame into detent position. The cabinet is closed when the rear-panel feet are inserted and the screws tightened.



ROHDE&SCHWARZ

Schlüsselliste
für Bauteile-Sachnummern

Code list
for component stock nos.

Liste des références
des composants

095.1000 Bl. 5

ROHDE&SCHWARZ

R&S-Schlüsselliste
R&S key list
Liste des symboles de référence R&S

Die R&S-Schaltteillisten nennen in der Spalte "Benennung/Beschreibung" die technischen Daten der Bauelemente in Kurzform. Die Art des Bauelements (z.B. Schicht-, Draht-Widerstand usw.) beschreiben die 2 Kennbuchstaben vor der "Benennung" (evtl. auch vor der "Sachnummer"), die nachfolgend erklärt werden. In Ersatzteil-Bestellungen an R&S ist stets die Angabe der vollständigen Sachnummer erforderlich.

The R&S Parts Lists give the technical data of the components in short form in the column "Benennung/Beschreibung" (designation). The type of component (e.g. depos.-carbon resistor, wire-wound resistor etc.) is indicated by 2 identification letters before the designation, possibly also before the "Sachnummer" (order number), which are explained below. When ordering spare parts from R&S, the complete order number must always be specified.

La colonne «Désignation/description» des listes de pièces de R&S indique les caractéristiques des éléments sous forme abrégée. Le type d'élément (p. ex. résistance à couche, résistance bobinée etc. ...) est décrit par les deux lettres précédant la désignation (et éventuellement le numéro de référence), dont voici l'explication. Prière d'indiquer le numéro de référence («Sachnummer») complet dans toute commande de pièces de rechange.

Teile-familie	Art des Bauelementes	Parts family	Type of component	Famille	Type d'élement
A	**Aktive Bauelemente, Halbleiter**	**A**	**Active components, semiconductors**	**A**	**Composants actifs, semiconducteurs**
AD	Universaldiode, z.B. Gleichrichter, Sperrdiode	AD	General-purpose diode, e.g. rectifier, high-resistance diode	AD	Diode d'usage général, p.ex. redresseur, diode à haute résistance
AE	Spezialdiode, z.B. Tunnel-, Kapazitäts-, Zener-Diode	AE	Diode (special), e.g. tunnel diode, varactor, Zener diode	AE	Diode spéciale, p.ex. diode tunnel, varactor, diode Zener
AF	Fotohalbleiter, z.B. Foto-Diode, -Transistor, -Widerstand, Leuchtdiode	AF	Photo-semiconductor, e.g. resistor, diode, transistor; LED	AF	Semiconducteur photoélectrique, p.ex. diode, transistor, résistance photoél., DEL
AG	Leistungs-Gleichrichter, z.B. Thyristor, Triac, Selengleichrichter	AG	Power rectifier, e.g. thyristor, triac, selenium rectifier	AG	Redresseur de puissance, p.ex. thyristor, triac, redresseur, au selenium
AK	Kleinsignal-Transistor	AK	Small-signal transistor	AK	Transistor faible puissance
AL	Leistungs-Transistor	AL	High-power transistor	AL	Transistor grande puissance
AM	Spezial-Transistor, z.B. FET, MOSFET	AM	Transistor (special), e.g. FET, MOS-FET	AM	Transistor spécial, p.ex. TEC, MOSTEC
AP	Peltier-, Hall-Element	AP	Peltier element, Hall element	AP	Element Peltier, élement Hall
AR	Rohre für Empfänger, Verstärker, Gleichrichter	AR	Valve for receiver, amplifier, rectifier	AR	Tube pour récepteur, amplificateur, redresseur
AS	Spezialrohre, z.B. Senderohre, EW-Widerstand, Stabilisator	AS	Valve (special), e.g. for transmitter, baretter, ballast valve	AS	Tube (spécial), p.ex. pour émetteur, resistance fer-hydrogène, ballast
AT	Katodenstrahlrohre, z.B. Bildrohre, Ziffern-Anzeigerohre	AT	Cathode ray tube, e.g. picture tube, digital indicator tube	AT	Tube à rayon cathodique, p.ex. tube à image, tube à affichage numérique
AZ	Zubehör für Halbleiter u. Rohren	AZ	Accessories for semiconductors and valves	AZ	Accessoires pour semiconducteurs et tubes
B	**Bausteine**	**B**	**PC boards, chips**	**B**	**Cartes imprimées, puces**
BC	Integr. Schaltkreis (Microcomp.)	BC	Integrated circuit (interface, A/D)	BC	Circuit intégré (microprocesseur)
BD	R&S-Dünnschicht- und Dickschichtschaltung	BD	R&S thinfilm or thickfilm circuit	BD	Circuit R&S à couche mince ou épaisse
BG	R&S-spezifische Gate-Arrays	BG	R&S gate arrays	BG	Circuits integres prédiffuses R&S
BJ	Integrierter Schaltkreis (Interface, A/D-Wandler)	BJ	Integrated circuit (interface, A/D converter)	BJ	Circuit intégré (interface, convertisseur A/N)
BL	Log. Schaltkreis z.B. DTL, TTL, HTL, ECL, C-MOS	BL	Logic circuit, e.g. DTL, TTL, HTL, ECL, C-MOS	BL	Circuit logique, p.ex. DTL, TTL, HTL, ECL, C-MOS
BM	Hybridbaustein, z.B. Mischer, Tuner, Modulator	BM	Hybrid chip, e.g. mixer, tuner, modulator	BM	Puce hybride, p.ex. mélangeur, tuner, modulateur
BO	Analogschaltkreis, z.B. Operationsverstärker	BO	Analog circuit, e.g. operational amplifier	BO	Circuit analogique, p.ex. amplificateur operationnel
BP	Optoelektronischer Baustein, z.B. Anzeigeeinheit, Koppler	BP	Optoelectronic component, e.g. display, coupler	BP	Composant optoélectronique, p.ex. afficheur, coupleur
BS	Schalt- und Steuerbaustein, elektronischer Sensor	BS	Switching and control modul, electronic sensor	BS	Modul de commutation et de commande, sonde electronique
BV	Stromversorgung, Übersp.-Schutz	BV	Power pack, protective circuit	BV	Alimentation, protection surcharge
BZ	Zubehör	BZ	Accessories	BZ	Accessoires

Teile-familie	Art des Bauelementes	Parts family	Type of component	Famille	Type d'element
C	**Kondensatoren**	**C**	**Capacitors**	**C**	**Condensateurs**
CB	Bypass-, Durchf.-Kondensator	CB	Bypass capacitor, feed-through capacitor	CB	Condensateur bypass, condensateur de traversée
CC	Keramischer Kondensator	CC	Ceramic capacitor	CC	Condensateur céramique
CD	Drehkondensator	CD	Variable capacitor	CD	Condensateur variable
CE	Elektrolytkondensator	CE	Electrolytic capacitor	CE	Condensateur électrolytique
CG	Glimmerkondensator	CG	Mica capacitor	CG	Condensateur au mica
CH	Sperrschichtkondensator	CH	Semiconductor capacitor	CH	Condensateur semiconducteur
CK	Kunstfolienkondensator	CK	Synthetic-foil capacitor	CK	Condensateur à feuille synthétique
CL	Ker. Hochsp.-Kondensator	CL	HV capacitor (ceramic)	CL	Condensateur HT céramique
CM	Metallpapier-Kondensator	CM	MP capacitor	CM	Condensateur à papier métallisé
CN	Kondensatornetzwerk	CN	Capacitor network	CN	Réseau capacitif
CP	Papierkondensator	CP	Paper capacitor	CP	Condensateur au papier
CS	Störschutzkondensator	CS	Interference-suppression capacitor	CS	Condensateur anti-parasite
CT	Trimmkondensator	CT	Trimmer capacitor	CT	Condensateur ajustable
CV	Vakuum-Kondensator	CV	Vacuum capacitor	CV	Condensateur à vide
D	**Drähte, Leitungen**	**D**	**Wires, lines**	**D**	**Fils, lignes**
DD	Schalt- und Wickeldraht	DD	Hook-up or winding wire	DD	Fil de câblage, fil de bobinage
DF	Flachleitung, Litze	DF	Flat multiple line, stranded wire	DF	Ligne plate, ligne torsadée
DG	Abgeschirmte Leitung	DG	Shielded line	DG	Ligne blindé
DH	Koaxialkabel	DH	Coaxial line	DH	Ligne coaxiale
DJ	Isolierschläuche, Schrumpfschläuche, Wellrohre, Schutzschläuche	DJ	Insulating sheaths, shrink-on sleeves, corrugated tubes, protective tubes	DJ	Gaines isolantes, gaines thermorétractables tubes ondulés, gaines protectrices
DL	HF-Litzen	DL	RF stranded wires	DL	Lignes torsadées RF
DM	Schaltlitzen (mehrdrähtige Leiter)	DM	Multi-conductor wires	DM	Lignes torsadées (multiconducteurs)
DN	Antenne	DN	Antenna	DN	Antenne
DO	Lichtleiter (optisch)	DO	Optical waveguides	DO	Guides d'onde optiques
DP	Leiterplatten (unbestückt)	DP	Printed circuit boards (bare)	DP	Cartes imprimées (non équipees)
DQ	Multilayer (unbestuckt)	DQ	Multilayer boards (bare)	DQ	Cartes multicouche (non équipees)
DS	Anschlußkabel (mehradrig)	DS	Connecting cable, multicore	DS	Câble de connexion (multiconducteur)
DU	Substratplatten für Dickschichtschaltungen	DU	Substrate boards for thickfilm circuits	DU	Cartes à substrat pour circuits à couche épaisse
DW	Festmantelkabel	DW	Rigid cables	DW	Câbles rigides
E	**Elektrische Teile**	**E**	**Electric parts**	**E**	**Organes électriques**
EB	Blei-, NC-Akku, Batterie	EB	Lead or alkaline accumulator, battery	EB	Accumulateur Pb/NC, batterie
ED	Gedruckte Schaltung (bestückte Leiterplatte), nicht steckbar	ED	Printed circuits (assembled), non-pluggable	ED	Circuits imprimés (équipés) non enfichables
EE	Gedruckte Schaltung (bestückte Leiterplatte), steckbar	EE	Printed circuits (assembled), pluggable	EE	Circuits imprimés (équipés) enfichables
EF	Glühlampe, Leuchte	EF	Incandescent lamp, pilot lamp	EF	Lampe à incandescence, voyant
EG	Glimmlampe, Entladungslampe	EG	Glow lamp, discharge lamp	EG	Lampe à luminescence lampe à decharge
EK	Kontakt-Streifen, -Feder	EK	Contact clip, contact spring	EK	Lampe de contact, ressort de contact
EL	Lautsprecher, Kopfhörer, Mikrofon	EL	Loudspeaker, headphones, microphone	EL	Haut-parleur, casque, microphone
EM	Motor, Hubmagnet, Drehfeldsystem	EM	Motor, lifting magnet, synchro system	EM	Moteur, électro-aimant de levage, système synchro
EO	Oszillator, z.B. Quarzoszillator	EO	Oscillator, e.g. crystal oscillator	EO	Oscillateur p.ex. oscillateur à quartz
EP	Tief-, Band-, Hochpaß, Bandsperre, Diskriminator	EP	Lowpass, bandpass, highpass filter, band-stop filter, discriminator	EP	Filtre passe-bas, passe-bande, passe-haut, suppression de bande, discriminateur
EQ	Schwing-, Filter-Quarz	EQ	Oscillator or filter crystal	EQ	Quartz oscillateur, quartz de filtre
ER	Resonator, piezoelektr./magnetostriktiv	ER	Resonator, piezoelectric/magnetostrictive	ER	Résonateur piézo-electrique/magneto-strictif
ES	Passive SHF-Bauteile	ES	Passive SHF-components	ES	Composant SHF passif
ET	Thermostat	ET	Thermostat	ET	Thermostat
EV	Lüfter, Gebläse	EV	Ventilator, blower	EV	Ventilateur, soufflerie

Teile-familie	Art des Bauelementes	Parts family	Type of component	Famille	Type d'element
F	**Fassungen, Steckverbindungen**	**F**	**Sockets, connectors**	**F**	**Douilles, connecteurs**
FG	Koax-Umrüstsatz	FG	Coaxial screw-in assembly	FG	Ensemble vissable coaxial
FH	Koax-Übergang auf Fremdsystem	FH	Coaxial adapter	FH	Adaptateur coaxial
FJ	BNC-Systemteil	FJ	BNC screw-in assembly	FJ	Ensemble vissable BNC
FK	Koaxial-UHF-Systemteil	FK	Coaxial UHF screw-in assembly	FK	Ensemble vissable coaxial UHF
FM	Mehrfachstecker, Buchsenleiste	FM	Multipoint connector	FM	Connecteur multiple
FN	Netz-Steckverbindung	FN	AC-supply connector	FN	Connecteur secteur
FO	Runde Mehrfach-Steckverbindung	FO	Round multipoint connector	FO	Connecteur multipoles rond
FP	Druckschalt-Steckverbindung	FP	Multipoint connector for PC boards	FP	Connecteur multipoles pour cartes imprimées
FR	Fassung für Lampe, Sicherung, usw.	FR	Socket for lamp, fuse, etc.	FR	Douille pour lampe, fusible etc. . . .
FT	Schwachstrom-Steckverbindung	FT	LV plug and socket	FT	Connecteur pour faible courant
FU	Hochspannungs-Steckverbindung	FU	HV plug and socket	FU	Connecteur pour haute tension
FV	Verbinder (z.B. AMP)	FV	Push-on connector	FV	Connecteur à enfichage
FZ	Zubehör für koax. Bauelemente	FZ	Accessories for coax. components	FZ	Accessoires pour composants coax
H	**Software**	**H**	**Software**	**H**	**Logiciel**
HP	Software-Komponenten und Software-Module	HP	Rights to software components and software modules	HP	Droits d'utilisation de composants et modules logiciel
HS	Auf Informationsträger geladene Software	HS	Software data media	HS	Logiciel sur support d'information
J	**Meßinstrumente**	**J**	**Indicators**	**J**	**Indicateurs**
JD	Drehspul-Anzeigeinstrument	JD	Moving-coil meter	JD	Galvanomètre à cadre mobile
JE	Dreheisen-Anzeigeinstrument	JE	Moving-iron meter	JE	Galvanomètre à fer mobile
JF	Frequenzmesser	JF	Frequency meter	JF	Fréquencemètre
JG	Drehspulinstrument mit Gleichrichter	JG	Moving-coil meter with rectifier	JG	Galvanomètre à cadre mobile avec redresseur
JH	Betriebsstundenzähler	JH	Operating-hours counter	JH	Compteur d'heures de fonctionnement
JJ	Impulszähler	JJ	Pulse counter	JJ	Compteur d'impulsions
JK	Kleinst-Instrument, z.B Abstimmanzeiger	JK	Mini-instrument, e.g. tuning indicator	JK	Petit indicateur, p.ex. indicateur d'accord
JM	Mechanisches Zählwerk	JM	Mechanical counter	JM	Compteur mécanique
JP	Projektions-Instrument (Leuchtziffer)	JP	Digital display	JP	Afficheur numérique
JQ	Quotientenmesser (Kreuzspulinstrum.)	JQ	Ratiometer (cross coul)	JQ	Quotientmètre (à cadres croises)
JU	Uhrwerk	JU	Clockwork	JU	Mouvement d'horlogerie
JW	Elektrodyn. Anzeigeinstrument	JW	Electrodynamic meter	JW	Instrument électrodynamique
L	**Induktivitäten, Magnetik**	**L**	**Inductors, magnetic components**	**L**	**Composants inductifs et magnétiques**
LB	Blech- und Schnittbandkern mit Zubehör	LB	Laminated and C-cores with accessories	LB	Noyaux feuilletés et noyaux de type C, avec accessoires
LC	Keramische Spule	LC	Ceramic coil	LC	Bobine céramique
LD	Netz-, HF-Drossel, Df-Filter	LD	Choke, lead-through filter	LD	Self de choc, filtre dé traversee
LE	Einzelkreis, Bandfilter	LE	Single tuned circuit, bandpass filter	LE	Circuit accordé, filtre passe-bande
LF	Ferritkern mit Zubehör	LF	Ferrite cores with accessories	LF	Noyaux en ferrite avec accessoires
LK	Karbonyleisenkern und elektrischer Kupferkern mit Zubehör	LK	Iron carbonyl slugs and copper slugs with accessories	LK	Noyaux en fer carbonyle et en cuivre, avec accessoires
LL	Luftspule	LL	Air-core coils	LL	Bobines à air
LM	Magnetband und -platte	LM	Magnetic tapes and disks	LM	Bandes et disques magnétiques
LS	Schirmbecher	LS	Screening cans	LS	Boîtiers de blindage
LT	Netztransformator	LT	Power transformer	LT	Transformateur secteur
LU	NF-Übertrager	LU	AF transformer	LU	Transformateur BF
LV	Variometer	LV	Variometer	LV	Variometre
LW	Wickelkörper, allgemein	LW	Coil formers, general	LW	Carcasses de bobine, en general

Teile-familie	Art des Bauelementes	Parts family	Type of component	Famille	Type d'element
R	**Widerstände**	**R**	**Resistors**	**R**	**Résistances**
RD	Drahtwiderstand	RD	Wire-wound resistor	RD	Résistance bobinée
RF	Kohleschicht-Widerstand	RF	Carbon-film resistor	RF	Resistance à couche de carbone
RG	Metallglasur-Widerstand	RG	Metal-coated resistor	RG	Résistance à couche métallique
RJ	Metalloxyd-Widerstand	RJ	Metal-oxide resistor	RJ	Resistance à oxyde métallique
RK	Kaltleiter, Heißleiter, Varistor	RK	PTC, NTC resistors, varistors	RK	Résistances CPT, CNT, varistors
RL	Metallfilm-Widerstand	RL	Metal-film resistor	RL	Résistance à film métallique
RN	Widerstandsnetzwerk	RN	Resistor network	RN	Reseau de résistance
RR	Draht-Potentiometer	RR	Wire-wound potentiometer	RR	Potentiomètre bobiné
RS	Schicht-Potentiometer	RS	Carbon-film potentiometer	RS	Potentiomètre à couche
RT	Dämpfungsglied, Abschlußwiderstand	RT	Attenuator, termination	RT	Atténuateur, charge
RV	Drahtwiderstand mit Abgriff	RV	Wire-wound resistor, tapped	RV	Résistance bobinée à prise
RW	Wendelpotentiometer	RW	Helical potentiometer	RW	Potentiomètre hélicoidal
S	**Schalter, Relais, Sicherungen**	**S**	**Switches, relays, fuses**	**S**	**Commutateurs, relais, fusibles**
SB	Drucktastenschalter	SB	Pushbutton switch	SB	Commutateur à touche
SD	Drehschalter	SD	Rotary switch	SD	Commutateur rotatif
SF	Kontaktfedersatz	SF	Spring contact assembly	SF	Jeu de ressorts de contact
SH	HF-Koaxialschalter, -Relais, -Teiler	SH	Coaxial RF switch, RF relay, RF attenuator	SH	Commutateur RF coaxial, relais RF, atténuateur RF
SK	Kipp-, Wipp- und Schiebeschalter	SK	Toggle switch, slide switch	SK	Commutateur à bascule, à glissière
SL	Leistungsschalter Netz/HF	SL	AC supply switch, high-power RF switch	SL	Commutateur secteur, de puissance RF
SM	Mikroschalter	SM	Microswitch	SM	Microrupteur
SN	Elektromagnet, Relais	SN	Electromagnetic relay	SN	Relais électromagnetique
SP	Leistungsrelais, Luftschütz	SP	Power relay, air-type contactor	SP	Relais de puissance, contacteur à air
SR	Reedrelais	SR	Reed relay	SR	Relais reed
SS	Sicherung, Schutzschalter	SS	Fuse, automatic cut-out	SS	Fusible, coupe-circuit automatique
ST	Thermoschalter	ST	Thermal circuit breaker	ST	Disjoncteur thermique
SU	Überspannungs-Ableiter	SU	Arrester	SU	Eclateur
SW	Wechselrichter, Naherungsschalter	SW	Inverter (DC-AC), proximity switch	SW	Inverseur (DC-AC), commutateur de proximite
SZ	Zeitschalter	SZ	Time switch	SZ	Interrupteur horaire
V	**Verbindungselemente**	**V**	**Connecting elements**	**V**	**Eléments de raccordement**
VK	Klemme, Klemmleiste	VK	Clamp, terminal strip	VK	Pince, reglette a bornes
VL	Lotose, Stutzpunkt	VL	Soldering lug	VL	Cosse à souder
VS	Schraube, Mutter, Scheibe	VS	Screw, nut, washer	VS	Vis, écrou, disque

Farbcode für Widerstände und Kondensatoren

Anmerkung:
Die Wertangabe der weitgenend miniaturisierten Bauelemente erfolgt überwiegend durch Farbkennzeichnungen, deren Bedeutung der nachfolgenden Tabelle entnommen werden kann

Hinweis:
Im Zuge des technischen Fortschrittes setzt R&S zunehmend Metallschichtwiderstande mit 1% Toleranz anstelle von Kohleschichtwiderstanden mit 5% Toleranz ein. Metallschichtwiderstande konnen sich dabei an Stellen befinden, an denen gemaß Schaltteilliste Kohleschichtwiderstande vorgesehen sind. Etwaige geringfugige Differenzen der Nennwerte zwischen Stromlaufplan, Schaltteilliste und Gerat liegen im zulassigen Toleranzbereich

Colour code for resistors and capacitors

Note:
The electrical values of the largely miniaturized components are mainly identified by a colour code, the meaning of which can be taken from the table below

N. B.:
Following the state of the art R&S makes increasing use of metal-film resistors (1% tolerance) instead of carbon-film resistors (5% tolerance). Metal-film resistors may have been employed where carbon-film resistors are specified in the parts list. Any slight differences of nominal values between circuit diagram, parts list and equipment are within tolerance.

Code couleur pour résistances et condensateurs

Remarque:
Les valeurs electriques des composants fort miniaturises sont indiquees dans la plupart des cas par un code couleur dont voici l'explication

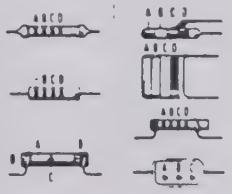
N. B.:
Suivant le progres technique R&S utilise de plus en plus des resistances a film metallique (tolerance 1%) au lieu des resistances a couche de carbone (tolerance 5%). Des resistances a film metallique peuvent se trouver en des points ou des types a couche de carbone figurent dans la liste des composants. Les differences minimes des valeurs nominales existant eventuellement entre le schema de circuit, la liste des composants et l'appareil sont dans la marge de tolerance

Farbe/Colour/Couleur	A	B	C	D
Schwarz/Black/Noir	—	0		
Braun, Brown/Marron	1	1	0	± 1%
Rot/Red, Rouge	2	2	00	± 2%
Orange, Orange	3	3	000	
Gelb/Yellow, Jaune	4	4	0000	
Grun/Green/Vert	5	5	00000	± 0.5%
Blau/Blue/Bleu	6	6	000000	
Violett/Violet	7	7	—	± 0.1%
Grau/Gray, Gris	8	8	—	
Weiß/White/Blanc	9	9	—	
Gold, Dore	—	—	—	± 5%
Silber Silver/Argente	—	—	—	± 10%
Ohne Farbe/No colour Pas de couleur	—	—	—	± 20%

1) Toleranzring, hier nicht spezifiziert

Anordnungsbeispiele für / Examples for / Exemple pour

Widerstände (R) / Resistors (R) / Resistance (R) — Kondensat (C) / Capacitors (C) / Condensateur (C)



1) Toleranzring, here not specified
1) Anneau de tolerance, ne pas specifie ici

Definition* / Definition * / Definition *

Kennzeichen A (Bauteilfarbe/1. Farbring) = 1. Zahl
Kennzeichen B (Bauteilende/2. Farbring) = 2. Zahl
Kennzeichen C (Punkt/3. Farbring) = 3. Zahl + Zahl der Nullen
Kennzeichen D (Punkt/4. Farbring) = Toleranz des Nennwerts in %
(Fehlendes Kennzeichen für D bedeutet ±20%)
Das Fehlen eines Kennzeichens bedeutet, daß die Farbe des Bauteilkorpers die Wertangabe darstellt

Marking A (body colour or first coloured ring) = 1st digit
Marking B (body end or second coloured ring) = 2nd digit
Marking C (dot or third coloured ring) = number of zeroes
Marking D (dot or fourth coloured ring) = tolerance on nominal value in %
(with no D marking tolerance ± 20%)
The absence of a marking signifies that the body colour gives the corresponding information

Reperage A (couleur du corps ou 1er anneau) = 1er chiffre
Reperage B (bout du corps ou 2e anneau) = 2e chiffre
Reperage C (point ou 3e anneau) = nombre de zeros
Reperage D (point ou 4e anneau) = tolerance en % de la valeur nominale
(L absence du reperage D signifie ± 20%)
L absence de tout reperage signifie que la couleur du corps du composant represente la valeur correspondante

* Siehe auch DIN 41 429 und DIN 40 825 — * see also IEC publication 62-1952 and 62-1968 — * Voir aussi DIN 41 429 et DIN 40 825

ROHDE&SCHWARZ

Zusammenstellung der lieferbaren Netzkabel
List of power cables available
Liste des câbles d'alimentation disponibles

Sach-Nr. Stock No. Référence	Schutzkontaktsteckker nach Earthed-contact connector Fiche à contact de protection	Vorzugsweise verwendet in Preferably used in Utilisé de préférence en
DS 006.7013	BS1363: 1967' entsprechend IEC 83: 1975 Standard B2	Großbritannien
	BS1363: 1967' complying with IEC 83: 1975 standard B2	Great Britain
	BS1363: 1967' suivant CEI 83: 1975 norme B2	Grande-Bretagne
DS 006.7020	Typ 12 nach SEV-Vorschrift 1011.1059, Normblatt S 24 507	Schweiz
	Type 12 complying with SEV regulation 1011.1059, standard sheet S 24 507	Switzerland
	Type 12 suivant la norme SEV 1011.1059, feuille S 24 507	Suisse
DS 006.7036	Typ 498/13 nach US-Vorschrift UL 498, bzw. IEC 83	USA/Kanada
	Type 498/13 complying with US regulation UL 498 or with IEC 83	USA/Canada
	Type 498/13 suivant la norme E.U.A. UL 498 ou la norme CEI 83	E.U.A./Canada
DS 006.7107	Typ SAA3 10 A, 250 V, nach AS C112-1964 Ap.	Australien
	Type SAA3 10 A, 250 V, complying with AS C112-1964 Ap.	Australia
	Type SAA3 10 A, 250 V, suivant AS C112-1964 Ap.	Australie
DS 0025.2365 DS 0099.1456	DIN 49 441, 10 A, 250 V, abgewinkelt DIN 49 441, 10 A, 250 V, gerade	Europa (ohne Schweiz)
DS 0025.2365 DS 0099.1456	DIN 49 441, 10 A, 250 V, angular DIN 49 441, 10 A, 250 V, straight	Europe (Switzerland not included)
DS 0025.2365 DS 0099.1456	DIN 49 441, 10 A, 250 V, angulaire DIN 49 441, 10 A, 250 V, droit	Europe (Suisse non comprise)

Cross-Reference List of Class Designation Letters

IEC Publication 113-2 (1971) Item Designations, Letter Codes
ANSI Y32.2-1975 (IEEE Std 315-1975), Section 22, Class Designation Letters

Note: The designation letters used in the R&S Manuals correspond to the letter codes of the IEC Standard identified in the first column!

IEC Publication 113-2 Terminology	Letter Code IEC	Y32.2
Acoustical indicator	H	LS
Adjustable resistor	R	R
Aerial	W	E
Amplifier	A	AR
Amplifier (with tubes)	A	AR
Arrester	F	E
Assemblies	A	A,U
Auxiliary switch	S	S
Battery	G	BT
Bistable element	D	U,A
Brake	Y	MP
Busbar	W	W
Cable	W	W
Cable balancing network	Z	Z
Capacitor	C	C
Changer	U	A,B,G,MT
Circuit breaker	Q	CB
Clutch	Y	MP
Coder	U	U,A
Compander	Z	A
Connecting stage	S	S
Contactors	K	K
Control switch	S	S
Converter	U	A,U,MG
Core, storage	D	E
Crystal filter	Z	FL
Crystal transducer	B	Y
Current transformer	T	T
Delay device	D	DL
Delay line	D	DL
Demodulator	U	A
Dial contact	S	S
Diode	V	D
Dipole	W	E
Disconnecting plug	X	P
Disconnecting socket	X	X
Discriminator	U	A
Disk recorder	D	A
Dynamotor	B	MG
Electrically operated mechanical device	Y	MT
Electronic tube	V	V
Equalizer	Z	EQ
Filter	Z	FL
Frequency changer	U	A,B,G
Fuse	F	F
Gas discharge tube	V	V
Generator	G	G
Heating device	E	HR
Hybrid	Z	Z
Indicating device	P	DS
Induction coil	L	L
Inductors	L	L
Integrating measuring device	P	M,MT,Z
Inverter	U	A,U,PS,MG
Isolator	Q	AT
Jumper wire	W	W
Laser	A	MT,A
Lighting device	E	DS
Limit switch	S	S
Limiter	Z	MT,RE
Line trap	L	FL,MP,V
Loudspeaker	B	LS
Magnetic amplifier	A	AR

IEC Publication 113-2 Terminology	Letter Code IEC	Y32.2
Magnetic tape recorder	D	A
Maser	A	A
Measuring equipment	P	M
Microphone	B	MK
Miscellaneous	E	E
Modulator	U	A
Monostable element	D	A,U
Motor	M	B
Optical indicator	H	DS
Oscillator	G	Y,G
Overvoltage discharge device	F	F,E
Parabolic aerial	W	E
Photoelectric cell	B	V
Pickup	B	PU
Plug	X	P
Pneumatic valve	Y	MP
Potentiometer	R	R
Power switchgear	Q	CB,S
Protective device	F	F
Pushbutton	S	S
Quartz-oscillator	G	Y
Recording device	P	A,M
Register	D	A,U,M
Relay	K	K
Resistor	R	R
Resolver	B	B
Rheostat	R	R
Rotating frequency generator	G	G,MG
Rotating generator	G	G
Selector	S	S
Selector switch	S	S
Semiconductor	V	D,CR,Q
Shunt (resistor)	R	R
Signal generator	P	A
Signaling device	H	DS
Socket	X	X
Soldering terminal strip	X	E,TB
Static frequency changer	U	A
Storage device	D	A,U
Subassembly	A	A
Supply	G	A,PS
Supply device	G	A,PS
Synchro	B	B
Telegraph translator	U	A
Terminal	X	E
Terminal board	X	TB
Termination	Z	AT
Test jack	X	E,J
Testing equipment	P	A
Thermistor	R	RT
Thermo cell	B	A,TC
Thermoelectric sensor	B	A
Thyristor	V	Q
Transducer (nonelectrical quantity to electrical quantity)	B	A,BT
Transformer	T	T
Transmission path	W	W
Transistor	V	Q
Tube (electron)	V	V
Voltage transformer (potential)	T	T
Waveguide	W	W
Waveguide directional coupler	W	DC

ROHDE&SCHWARZ

Schaltteillisten
numerisch geordnet

Part lists
in numerical order

Listes des pièces détachées
par numéros de référence

095.1000 Bl. 3

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
A2	GJ SCHALTNETZTEIL-APFC- SWITCHING POWER SUPPLY	1039.1510.00	PULS	TYP APFC	
A3	ZE FRONTMODUL FRONT MODULE NUR VAR/ONLY MOD: 02 03 06	1035.5440.05			
A3	ZE FRONTMODUL NUR VAR/ONLY MOD: 53 62 63	1035.5440.15			
A7	EE REFERENZ STEPSYNTHESE REFERENCE STEP SYNTH.	1035.6501.02			
A8	EE DIGITALE SYNTHESE DIGITAL SYNTHESE	1038.7344.02			
A9	ED SUMMIERSCHLEIFE SUMMING LOOP	1038.7196.02			
A15	ZE EICHL.(SME) ATTENUATOR (SFQ/SME/I/T) NUR VAR/ONLY MOD: 02 03 53 62 63	1008.7375.02			
A15	ZE EICHL.(SME) ATTENUATOR 6 GHZ NUR VAR/ONLY MOD: 06	1008.7400.02			
A25	ED BNC CONNECTOR BOARD BNC CONNECTOR BOARD NUR VAR/ONLY MOD: 06	1084.9200.02			
A200	ED MOTHERBOARD MOTHERBOARD NUR VAR/ONLY MOD: 02 03 53 62 63	1084.9000.02			
A200	ED MOTHERBOARD MOTHERBOARD NUR VAR/ONLY MOD: 06	1084.9030.02			
A220	EE IQ-CONVERTER IQ CONVERTER	1084.9300.04			
A240	EE IQ-MODULATOR IQ MODULATOR	1084.9800.08			
A250	ED FAN UNIT FAN UNIT NUR VAR/ONLY MOD: 06	1084.8904.02			
A320	EE MODULATIONSCODER MODULATION CODER NUR VAR/ONLY MOD: 62 63	1085.5050.02			
A340	EE DATENGENERATOR EE DATA GENERATOR NUR VAR/ONLY MOD: 62 63	1085.4560.04			
A350	EE SPEICHERERWEITERUNG MEMORY EXTENSION NUR VAR/ONLY MOD: 62 63	1085.2845.04			
A351	EE SPEICHERERWEITERUNG MEMORY EXTENSION NUR VAR/ONLY MOD: 62 63	1085.2845.04			
A500	EE 6 GHZ-ERWEITERUNG 6 GHZ EXTENSION NUR VAR/ONLY MOD: 06	1084.9600.02			
A600	EE N/D SIMULATOR N/D SIMULATOR NUR VAR/ONLY MOD: 62 63	1104.9080.02			
E1	DX LUEFTEREINHEIT BLOWER UNIT NUR VAR/ONLY MOD: 02 03 53 62 63	1038.6402.00			
W25	DV KABEL W25 NUR VAR/ONLY MOD: 06	1084.9098.00			
W72	DV HF-KABEL W72 RF CABLE W72	1038.9660.00			
W73	DV HF-KABEL W73 RF CABLE W73	1038.9676.00			
W75	DV HF-KABEL W75 RF CABLE W75	1038.9682.00			
W77	DW HF-KABEL W77 RF CABLE W77	1085.0436.00			
W89	DV HF-KABEL W89 RF CABLE W89	1038.9724.00			
W91	DV HF-KABEL W91 RF-CABLE W91	1085.0407.00			
W152	DW HF-KABEL W152 RF CABLE W152 NUR VAR/ONLY MOD: 02 03 53 62 63	1085.0313.00			

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
W152	DW HF-KABEL W152 DW RF-CABLE W152 NUR VAR/ONLY MOD: 06	1085.0459.00			
W201	DY KABEL W201 CABLE W201	1085.0371.00			
W203	DY KABEL W203 CABLE W203	1085.0394.00			
W208	DY KABEL W208 CABLE W208	1085.0388.00			
W223	DW HF-KABEL W223 RF CABLE W223	1085.0342.00			
W227	DW HF-KABEL W227 RF CABLE W227	1085.0294.00			
W241	DV HF-KABEL W241 RF CABLE W241	1085.0365.00			
W243	DV HF-KABEL W243 RF CABLE W243	1085.0359.00			
W244	DV HF-KABEL W244 RF CABLE W244	1085.0320.00			
W245	DV HF-KABEL W245 RF CABLE W245	1085.0336.00			
W249	DW HF-KABEL W249 RF CABLE W249	1085.0307.00			
W313	DY KABEL W313 (RS232) CABLE W313 (RS232)	1039.0008.00			
W314	DY KABEL W314 (IEC-BUS) CABLE W314 (IEC-BUS)	1038.9999.00			
W322	DV KABEL W322 CABLE W322 NUR VAR/ONLY MOD: 62 63	1085.5209.00			
W324	DV KABEL W324 CABLE W324 NUR VAR/ONLY MOD: 62 63	1085.5215.00			
W325	DV KABEL W325 CABLE W325 NUR VAR/ONLY MOD: 62 63	1085.5221.00			
W326	DV KABEL W328 CABLE W328 NUR VAR/ONLY MOD: 62 63	1085.5238.00			
W341	DY KABEL RS232/2 CABLE RS232/2	1085.0413.00			
W501	DW HF-KABEL W501 RF-CABLE W501 NUR VAR/ONLY MOD: 06	1085.0465.00			
W502	DW HF-KABEL W502 RF CABLE W502 NUR VAR/ONLY MOD: 06	1085.0471.00			
W503	DV HF-KABEL W503 RF CABLE W503 NUR VAR/ONLY MOD: 06	1085.0488.00			
W504	DV HF-KABEL W504 RF CABLE W504 NUR VAR/ONLY MOD: 06	1085.0494.00			
W505	DW HF-KABEL W505 RF-CABLE W505 NUR VAR/ONLY MOD: 06	1085.0507.00			
W506	DW HF-KABEL W506 DW RF CABLE W506 NUR VAR/ONLY MOD: 06	1085.0513.00			
W601	DV KABEL W601 CABLE W601 NUR VAR/ONLY MOD: 62 63	1104.9280.00			
W602	DV KABEL W602 CABLE W602 NUR VAR/ONLY MOD: 62 63	1104.9297.00			
W603	DV KABEL W603 CABLE W603 NUR VAR/ONLY MOD: 62 63	1104.9300.00			
W604	DV KABEL W604 CABLE W604 NUR VAR/ONLY MOD: 62 63	1104.9316.00			
W605	DV KABEL W605 CABLE W605 NUR VAR/ONLY MOD: 62 63	1104.9322.00			
W606	DV KABEL W606 CABLE W606 NUR VAR/ONLY MOD: 62 63	1104.9339.00			

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
X207	FJ EINBAUBUCHSE SYST.BNC BNC-CONNECTOR UG 625CIU	FJ 0099.9186.00	ROSENBERGE	51K-503-200-N4	
X208	FJ EINBAUBUCHSE SYST.BNC BNC-CONNECTOR UG 625CIU	FJ 0099.9186.00	ROSENBERGE	51K-503-200-N4	
X209	FJ EINBAUBUCHSE SYST.BNC BNC-CONNECTOR UG 625CIU	FJ 0099.9186.00	ROSENBERGE	51K-503-200-N4	
X400	FM BUL.12 NORM.K.5KOAXK CONNECTOR	FM 0070.0997.00	FCT	FM17W5S	
X401	FJ EINBAUBUCHSE SYST.BNC BNC-CONNECTOR UG 625CIU NUR VAR/ONLY MOD: 02 03 53 62 63	FJ 0099.9186.00	ROSENBERGE	51K-503-200-N4	
X402	FJ EINBAUBUCHSE SYST.BNC BNC-CONNECTOR UG 625CIU NUR VAR/ONLY MOD: 02 03 53 62 63	FJ 0099.9186.00	ROSENBERGE	51K-503-200-N4	
X403	FJ EINBAUBUCHSE SYST.BNC BNC-CONNECTOR UG 625CIU NUR VAR/ONLY MOD: 02 03 53 62 63	FJ 0099.9186.00	ROSENBERGE	51K-503-200-N4	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
.	XX VARIANTENERKLAERUNG IDENTIFICATION OF MODELS				
C1	CC 220NF+-10%50V X7R 1210 CERAMIC CAPACITOR CHIP	CC 0520.6850.00	AVX	1210 5C 224 KAT2A	
C2	CC 220NF+-10%50V X7R 1210 CERAMIC CAPACITOR CHIP	CC 0520.6850.00	AVX	1210 5C 224 KAT2A	
L1	LD 4,7UH BEI 1,35A0,240HM CHOKE	LD 0026.4084.00	DALE	IM 6	
L2	LD 470NH 20% OR09 1,7A CHOKE	LD 0026.3742.00	DALE	IM 6	
U1	BV PT79SR152S -1.5A SWITCHING REGULATOR	BV 1085.1778.00	POWER_TREN	PT79SR152S	
V2	XX TRIMMWERT SELECTED				
W20	DY KABEL W20 CABLE W20	1084.9069.00			
W28	DY KABEL W28 CABLE W28	1084.9075.00			
X2	FM STECKERLEISTE 50P.WINK CONNECTOR 50P	FM 0516.3315.00	FCT	F50P5G1-K45	
X4	FP BUCHSENLEISTE 64P. CONNECTOR 64P	FP 0008.5699.00	ERNI	033.746	
X7 ..9	FP BUCHSENLEISTE 32POL. CONNECTOR 32POL.	FP 0008.5676.00	ERNI	043.607	
X15	FP STECKERLEISTE 16P.GER CONNECTOR	FP 4007.2304.00	SIEMENS	V23535-A2200-A162	
X22	FP STECKERLEISTE 16P.GER CONNECTOR 16 WAY	FP 0645.6761.00	BERG_ELEKT	71918-116	
X24	FP STECKERLEISTE 34P.GER CONNECTOR 34P	FP 0645.7145.00	BERG_ELEKT	71918-134	
X25	FP STIFTLEISTE 4P.R2,54 PIN CONNECTOR	FP 0009.6147.00			
X27	FP STIFTL.WIN 7P.R2,54 ANGLE PIN CONNECTOR	FP 0009.7237.00			
X50	FP STECKERLEISTE 50P.GER CONNECTOR 50P.	FP 0099.9434.00	BERG_ELEKT	71918-150	
X220	FP BUCHSENLEISTE 32POL. CONNECTOR 32POL.	FP 0008.5676.00	ERNI	043.607	
X240	FP BUCHSENLEISTE 32POL. CONNECTOR 32POL.	FP 0008.5676.00	ERNI	043.607	
X320	FP BUCHSENLEISTE 64P. CONNECTOR 64P	FP 0008.5699.00	ERNI	033.746	
X340	FP BUCHSENLEISTE 64P. CONNECTOR 64P	FP 0008.5699.00	ERNI	033.746	
X360	FP BUCHSENLEISTE 64P. CONNECTOR 64P	FP 0008.5699.00	ERNI	033.746	
X380	FP BUCHSENLEISTE 64P. CONNECTOR 64P	FP 0008.5699.00	ERNI	033.746	

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XY-Liste

XY List

Erklärung der Spaltenbezeichnungen:

el. Kennz.	**Bauelement-Kennzeichen**
Seite	**Leiterplatten-Seite, auf der sich das Bauelement befindet**
X/Y	**Koordinaten (in Millimeter) des Bauelementes auf der Leiterplatte bezogen auf den Nullpunkt**
Planq., Bl.	**Planquadrat und Seite des Schaltbildes für das jeweilige Bauelement**

Explanation of column designations:

Part	**Identification of instrument part**
Side	**Side of the PC board on which instrument part is positioned**
X/Y	**Coordinates (in units of millimeters) of the component on the PC board in reference to zero point**
Sqr, Pg	**Square and page of the diagram for the respective instrument part**

Nicht–Service–Relevante Bauteile / Non–Service–Relevant Components

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
C1	B	18	258	10A	2
C2	B	15	251	9A	2
L1	B	22	288	10A	2
L2	B	22	236	8A	2
U1	B	16	259	9A	2
V2	B	28	274	9A	2
W20	B	125	241	7E	1
W28	B	125	98	4E	2
X2	B	67	293	11D	2

el. Kennz *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
X4	B	112	30	4D	1
X7	B	112	175	11D	1
X8	B	112	144	10D	1
X9	B	112	114	8D	1
X15	B	133	8	3E	1
X22	B	100	306	10D	2
X24	B	92	295	8D	2
X25	B	140	304	12D	2

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
X27	B	123	175	10E	1
X50	B	86	8	3D	1
X220	B	112	81	7D	1
X240	B	112	55	6D	1
X320	B	112	203	2D	2
X340	B	112	231	4D	2
X360	B	112	256	6D	2
X380	B	112	281	7D	2

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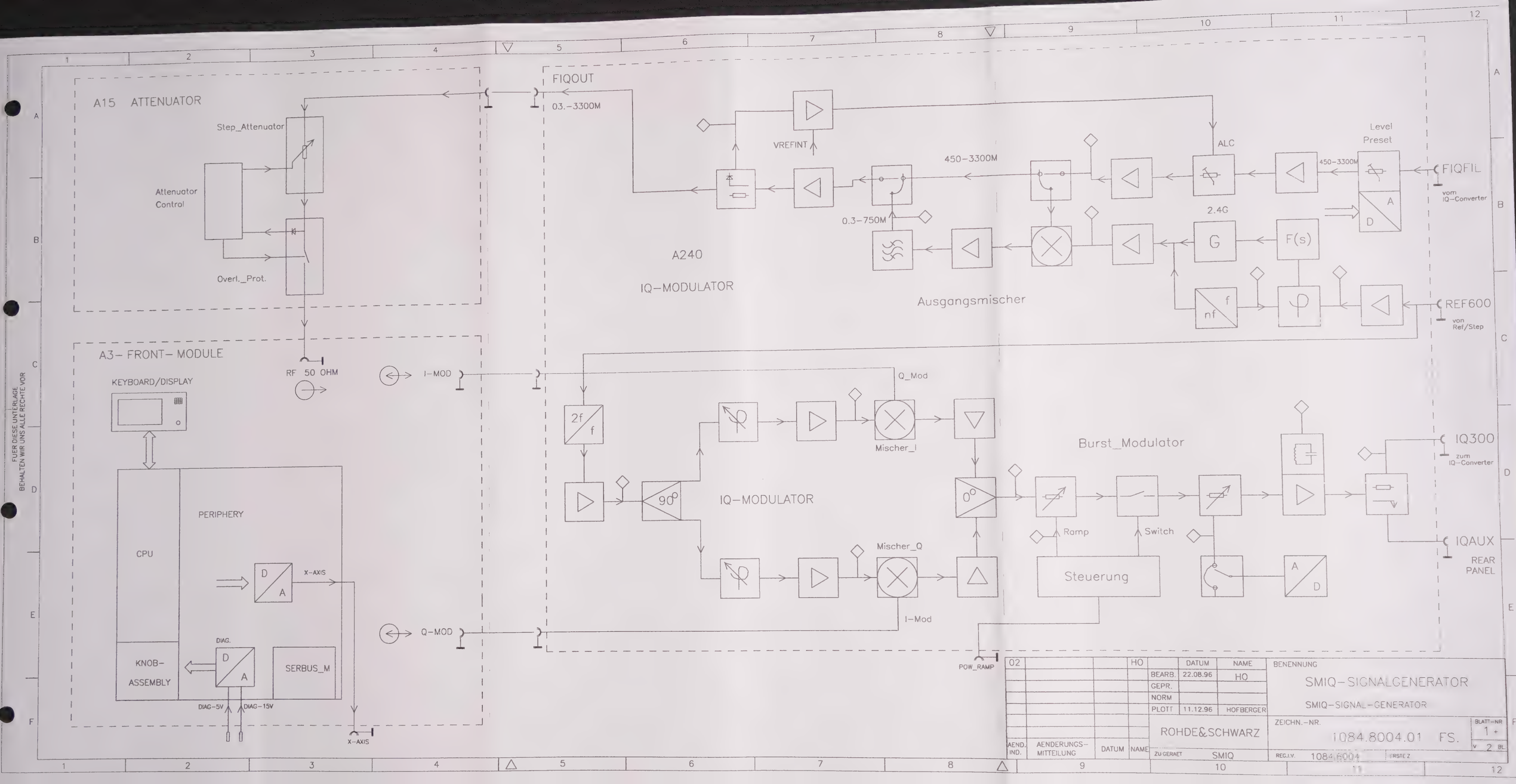
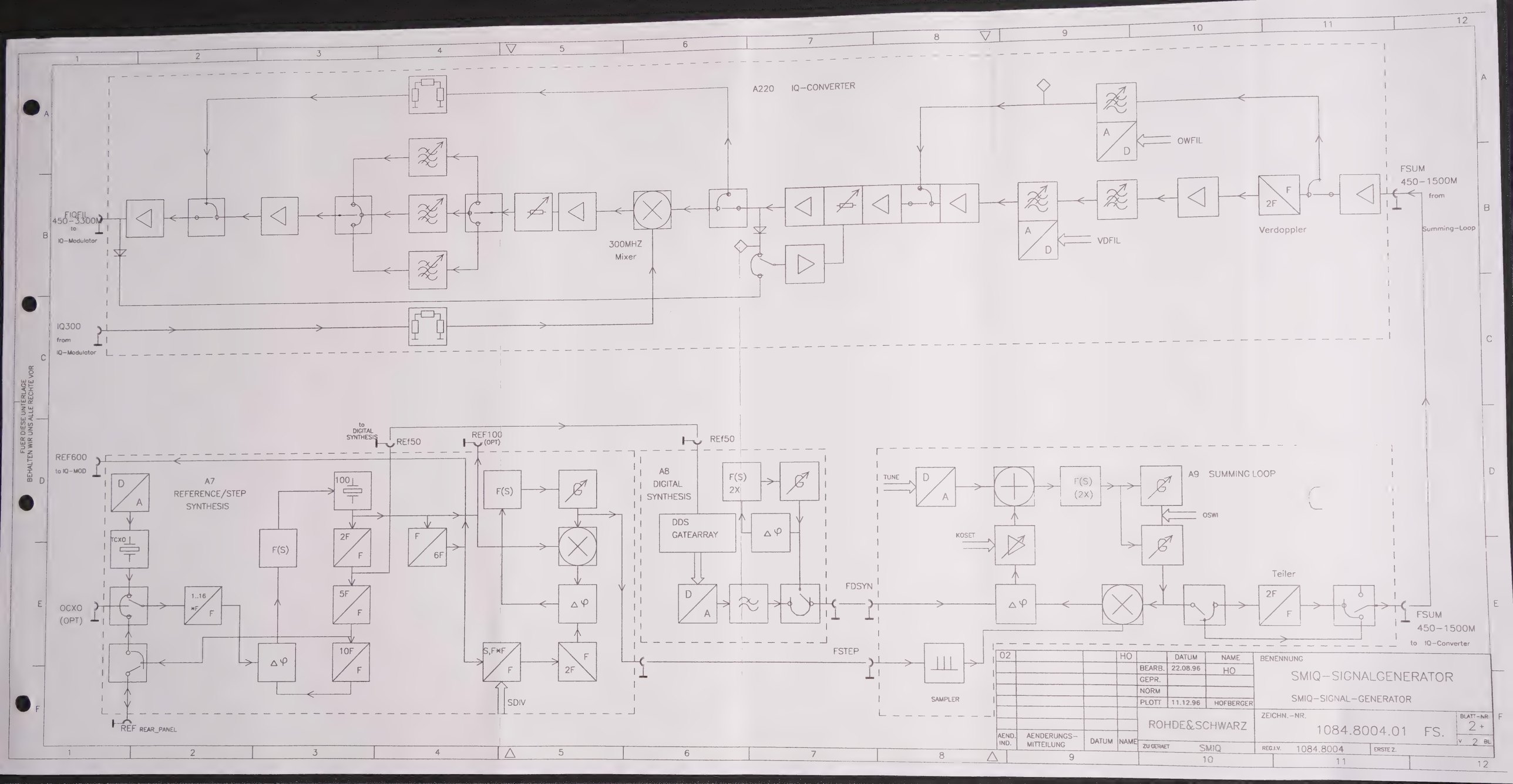
ROHDE&SCHWARZ

Stromläufe
Bestückungspläne

Circuit diagrams
Component plans

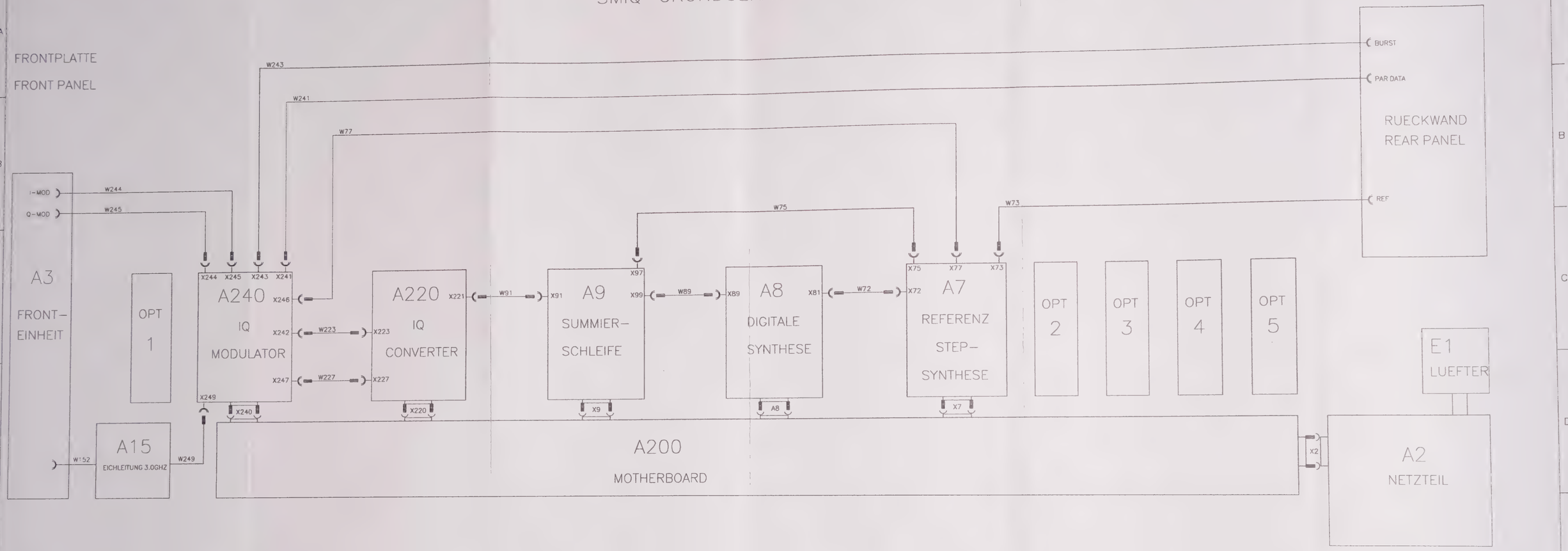
Schémas de circuit
Plans des composants


A15 ATTENUATOR
Step_Attenuator
Attenuator Control
Overl._Prot.
RF 50 OHM
A3– FRONT– MODULE
KEYBOARD/DISPLAY
PERIPHERY
CPU
KNOB– ASSEMBLY
SERBUS_M
DIAG.
DIAG–5V
DIAG–15V
X–AXIS
I–MOD
Q–MOD
FIQOUT
03.–3300M
VREFINT
450–3300M
0.3–750M
A240
IQ–MODULATOR
Ausgangsmischer
ALC
Level Preset
FIQFIL
vom IQ–Converter
2.4G
G
F(s)
REF600
von Ref/Step
2f
f
90°
Q_Mod
Mischer_I
Mischer_Q
I–Mod
0°
Burst_Modulator
Ramp
Switch
Steuerung
IQ300
zum IQ–Converter
IQAUX
REAR PANEL
POW_RAMP
FÜR DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR
SMIQ–SIGNALGENERATOR
SMIQ–SIGNAL–GENERATOR
ROHDE&SCHWARZ
ZEICHN.–NR.
1084.8004.01 FS.
BEARB. 22.08.96 HQ
GEPR.
NORM
PLOTT 11.12.96 HOFBERGER
ZU GERAET SMIQ
REG.I.V. 1084.6004



FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

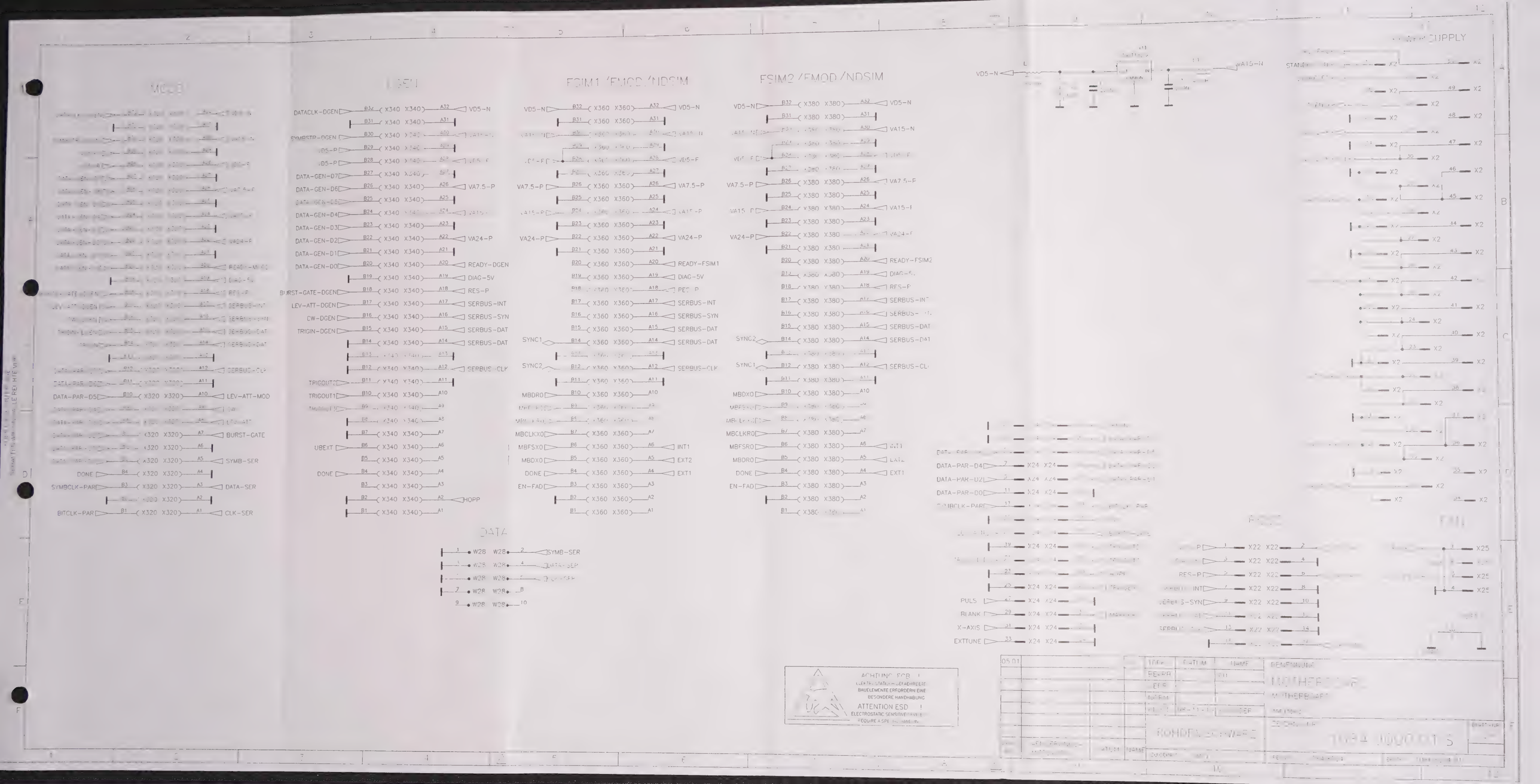
SMIQ-GRUNDGERAET



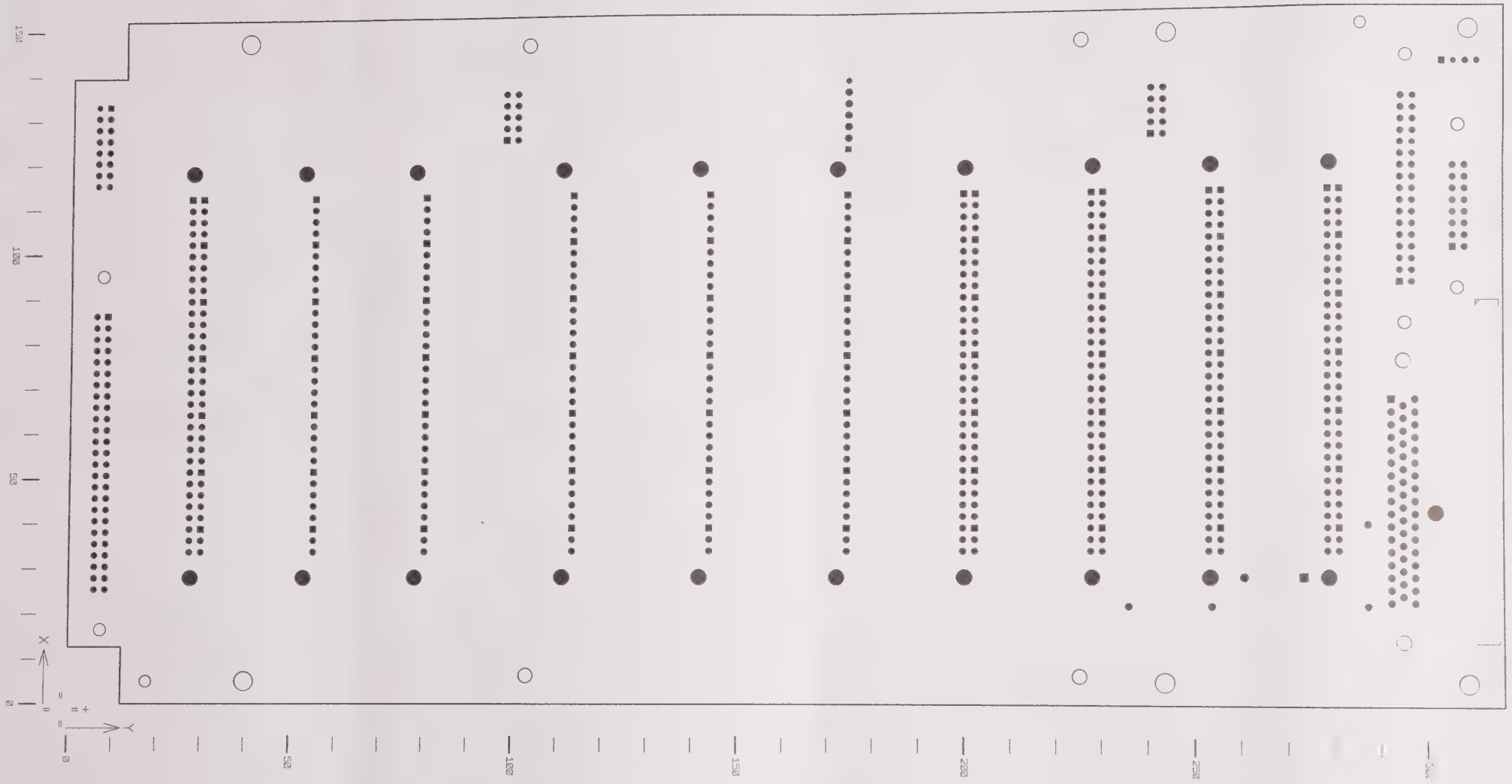
FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

02			HO		DATUM	NAME	BENENNUNG
				BEARB.		HO	SMIQ-SIGNALGENERATOR
				GEPR.			SMIQ-SIGNAL-GENERATOR
				NORM			
				PLOTT	13.12.96	HOFBERGE	
AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ			ZEICHN.-NR. 1084.8004.01 S
				ZU GERAET SMIQ			BLATT-NR. 1 + V 1 BL.
				REG.LV. 1084.8004			ERSTE Z

READY-FSIM1
READY-FSIM2
BLANK
MARKER
READY-DGEN
READY-MCOD
READY-NDSIM
VA15-N
VA15-P
VD5-P
VD5-N
VA7.5-P
VA24-P
SERBUS-INT
SERBUS-SYN
SERBUS-DAT
SERBUS-CLK
LEV-ATT-MOD
CODAM
PULS
INT1
EXT2
EXT1
LFOUT
VREFAM
BLANK
OPTTUNE
DGND
X50
X15
X4
X240
X220
X9
X8
FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR
ACHTUNG EGB !
ELEKTROSTATISCH GEFAEHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG
ATTENTION ESD !
ELECTROSTATIC SENSITIVE DEVICES
REQUIRE A SPECIAL HANDLING
05.01
GU
1GPK
PEAPP
GEPR
NORM
PLOTT
ROHDE
AENDERUNGS-
MITTEILUNG
DATUM
NAME
ZU GERAET



MODE
LGEN
FSIM1 /FMOD /NDSIM
FSIM2 /FMOD /NDSIM
POWER SUPPLY
DATA
DATACLK-DGEN
SYMBSTR-DGEN
DATA-GEN-D7
DATA-GEN-D6
DATA-GEN-D5
DATA-GEN-D4
DATA-GEN-D3
DATA-GEN-D2
DATA-GEN-D1
DATA-GEN-D0
BURST-GATE-DGEN
LEV-ATT-DGEN
CW-DGEN
TRIGIN-DGEN
TRIGOUT2
TRIGOUT1
UBEXT
DONE
SYMBCLK-PAR
BITCLK-PAR
VD5-N
VA7.5-P
VA24-P
READY-DGEN
DIAG-5V
RES-P
SERBUS-INT
SERBUS-SYN
SERBUS-DAT
SERBUS-CLK
HOPP
SYNC1
SYNC2
MBDR0
MBCLKX0
MBFSX0
MBDX0
EN-FAD
INT1
EXT2
EXT1
READY-FSIM1
READY-FSIM2
VA15-N
MBDX0
MBCLKR0
MBFSR0
DATA-PAR-D5
DATA-PAR-D4
DATA-PAR-D2
DATA-PAR-D0
LEV-ATT-MOD
BURST-GATE
SYMB-SER
DATA-SER
CLK-SER
PULS
BLANK
X-AXIS
EXTTUNE
SYMB-SER
ACHTUNG ESD !
ELEKTROSTATISCH GEFÄHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG
ATTENTION ESD !
ELECTROSTATIC SENSITIVE DEVICE REQUIRE A SPECIAL HANDLING
05.01
RENEMINUNG
MOTHERBOARD
ROHDE & SCHWARZ



DARSTELLUNG SEITE A
VIEW ON SIDE A

ACHTUNG: EGB!

BINDENDE ANGABEN UEBER VARIANTEN, TRIMMWERTE, BAUTEILWERTE UND NICHT BESTUECKTE BAUTEILE SIEHE SA.

FOR BINDING INFORMATION ON MODELS, TRIMMING AND COMPONENTS VALUES AND NONFITTED COMPONENTS SEE PARTS LIST.

AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME

	DATUM	NAME
GEPR.		
NORM		

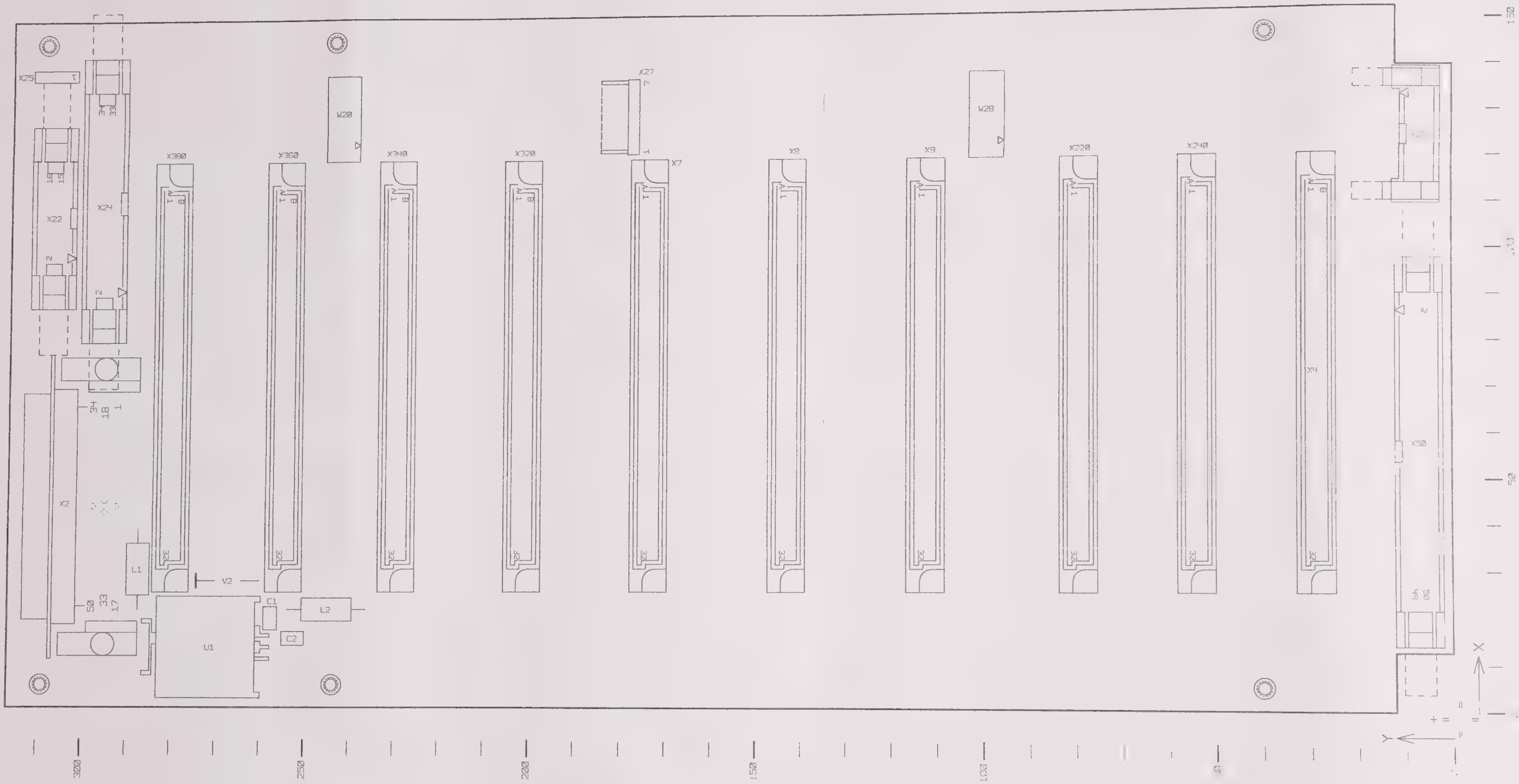
ROHDE&SCHWARZ

BENENNUNG
MOTHERBOARD
MOTHERBOARD

ZEICHN.-NR.
1084.9000.01 D

BLATT NR. 2+

Z. 1084 8004



DARSTELLUNG SEITE B
VIEW ON SIDE B

ACHTUNG: EGB!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG.
ATTENTION ESD!
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING

BINDENDE ANGABEN UEBER VARIANTEN, TRIMMWERTE, BAUTEILWERTE UND NICHT BESTUECKTE BAUTEILE SIEHE SA.

FOR BINDING INFORMATION ON MODELS, TRIMMING AND COMPONENTS VALUES AND NONFITTED COMPONENTS SEE PARTS LIST.

AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME
05.00			GL

	DATUM	NAME
BEARB.		GU
GEPR.		GU
NORM		
PLOTT	10.09.97	GUDER

ROHDE&SCHWARZ
ZU GERAET SMIQ

BENENNUNG
MOTHERBOARD
MOTHERBOARD

ZEICHN.-NR.
1084.9000.01 D

BLATT NR. 1+

REL. 1084.8004
ERSTE Z. 1084.8004

ROHDE&SCHWARZ

SERVICEUNTERLAGEN

Frontmodul mit Rechner VAR 06

1035.5440

Variantenerklärung des Gesamtmoduls:

1035.5440.02 SMP

1035.5440.03 SME

1035.5440.04 SMT

1035.5440.05 SMIQ

Inhaltsverzeichnis

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7. Prüfen und Instandsetzen der Baugruppe

Achtung !! Im Frontmodul sind viele betriebsnotwendige Daten gespeichert. Die im RAM gespeicherten Daten können vom Gerät selbst, die Daten im Flash-EPROM jedoch nur mit Hilfsmitteln wieder hergestellt werden. Besteht die Gefahr, den Speicherinhalt der Flash-EPROMs zu verlieren, muss sichergestellt sein, dass

1) neue Firmware geladen werden kann,

2) eine Pegelkalibration durchgeführt werden kann (Kap. 6.4 des Service-Handbuches),

3) die Kalibrierdaten des Referenzoszillators wieder hergestellt oder eine Kalibration des Referenzoszillators durchgeführt werden kann (Kap. 2.11.8 des Betriebshandbuches),

4) die Betriebsdaten im Menue UTILITIES/DIAG/PARAM wieder hergestellt werden können.

Zu 3) und 4) sollten vor Arbeiten am Frontmodul die betreffenden Daten notiert werden. Zur Wiederherstellung muss für 3) der Passwortschutz Level 2 entriegelt werden (Kap. 2.11.7 des Betriebshandbuches). Das Passwort für Level 2 ist 250751. Danach kann im Menue UTILITIES/CALIB/REF OSC der notierte Wert wieder eingegeben und gespeichert werden. Für 4) muss der Passwortschutz Level 3 entriegelt werden, das Passwort erfragen Sie bitte bei Ihrer R&S-Vertretung. Das Menue UTILITIES/DIAG/SET PARAM wird dann sichtbar und die Daten können wieder eingegeben werden.

7.1 Funktionsbeschreibung

Das Frontmodul beinhaltet die Komponenten: Rechner, Drehgeber, Tastatur und das LC-Display.
Folgende Funktionen und Eigenschaften muß der Rechner zur Verfügung stellen:

- CPU: 80960SB-16
- Batteriegepuffertes RAM
- Batterietest
- Firmware in Flash-Eprom's mit der Möglichkeit des Updates
- IEC-Bus Interface
- SERBUS Interface
- RS232 / V.24 Interface
- Timer
- Interruptcontroller
  alle Interrupts entweder in der Quelle oder am Interruptcontroller einzeln maskierbar
- ACFAIL vom Netzteil löst maskierbaren Interrupt aus
- Verarbeitung externer Triggersignale
  (TRIGGER, AUX-TRIG) Polarität & Triggerart (dyn./stat.) wählbar
- LCD-Interface
- Helligkeits- und Kontrasteinstellung für LCD
- Drehknopf-Interface
- Anschluß für Tastaturmatrix
- Selbstdiagnose mit 12-Bit-Wandler und

zwei Diagnoseeingänge (±5V & ±15V)
- X-Ausgang (0 ... 10 V)
- Varianten-/Änderungszustandserkennung
- Einige Steuerleitungen für andere Baugruppen (MODCTRL-OUT, MODCTRL-IN)
- Digitale Aus- & Eingangssignale (BLANK, MARKER, SWEEP-STOP, TASTENBEEP)
- SYS-RESET vom Netzteil löst einen Reset des Systems aus
- Standby-Schalter und Standby-LED

7.1.1 CPU: 80960SB-16

Die Verwendung des Prozessors 80960 (Taktfrequ.: 16MHz) erfordert definierte RESET und Taktsignale für das gesamte Rechnersystem. Diese Signalerzeugung wird in einem ASIC (CLKGEN D3) realisiert. In diesem ASIC erfolgt auch die Ableitung einiger im System verwendeter Taktfrequenzen.
Da das Bus-Interface des 80960 auf BURST-Zugriffe ausgelegt ist, werden mehrere PLD's verwendet (D300, D402, D540, D600, D800, D950). Sie dienen der Umsetzung des BURST-Zugriffes in den für die angeschlossenen Bausteine entsprechende Ansteuerung. Zugleich erzeugen sie das READY-Signal zur Anpassung der Zugriffsgeschwindigkeit. Die Zusammenführung der verschiedenen READY-Signale zu einem gemeinsamen Signal für den Prozessor erfolgt über eine AND- Verknüpfung an D103.
Der Prozessor 80960 verfügt über einen gemultiplexten Adress- und Datenbus. Während des Adress-Cycle der CPU werden die Adressen A4 bis A15 in die Bausteine D204, D205 und D216 übernommen und stehen dann während der folgenden Data-/Wait-Cycle und des abschließenden Recovery-Cycle zur Verfügung.
Die beiden Datenbustreiber D208 und D209 werden benötigt, um eine Isolation des Datenbusses vom gemultiplexten Daten-/Adressbus des Prozessors zu erreichen. Dies ist beim Einsatz langsamer Peripheriebausteine notwendig.

7.1.2 Batteriegepuffertes RAM

Dieser Speicher wird mittels acht 1M-Bit SRAM-Speicherbausteinen (D302...D309) in Form von vier Bänken zu je 128K-Worten realisiert.(1 Wort=16bit). Der Zugriff auf diesen Speicher wird durch das Signal EN-MEM-P blockiert, wenn entweder das Resetsignal aktiv ist oder die Versorgungsspannung unter 4 V absinkt (V21, V3). Diese Überwachung der Versorgungsspanung ist nur für den Notfall gedacht, daß die Spannung plötzlich zusammenbricht, ohne daß vorher vom Netzteil das Signal SYSRESET generiert wurde.
Die Schaltung aus den Transistoren V11 und V2 sowie der Diode V7 bewirkt ein Umschalten von UBATT auf +5V, sobald die Versorgungsspannung +5V größer als die Batteriespannung ist.

7.1.3 Batterietest

Um den Ladezustand der Batterie zu testen, wird durch das Signal TST-BATT mittels REED-Relais ein Belastungswiderstand von 39,2kOhm an die Batterie angeschlossen. Die Spannung am Widerstand wird der Selbstdiagnoseschaltung zugeführt und gibt Auskunft über den Zustand der Batterie.

7.1.4 FLASH-EPROM's (Firmware-Update)

Um Firmware-Updates ohne Eingriff von außen durchführen zu können, werden FLASH-EPROM's als Speicher verwendet. Es sind zwei Bausteine D1,D2_vom Type 28F016 (2M-Worte) vorgesehen.
Die zum Programmieren nötige Spannung VPP wird durch den Baustein D400 aus +15V erzeugt. Dieser Linearregler kann durch das Signal VPP-EIN an- und abgeschaltet werden.
Der Update der Firmware erfolgt über eine RS232-Schnittstelle an der Rückseite des Gerätes.
Den Urlader enthält das BOOT-EPROM (D301). Es erlaubt das Bestücken der FLASH-EPROM's als unprogrammierte Standardbauteile.

7.1.5 IEC-Bus Interface

Als IEC-Bus-Controller wird der Baustein TNT4882C (D60) verwendet. Damit können auch alle Controller-Fähigkeiten des IEC-Bus realisiert werden. Seine 40MHz-Taktfrequenz erhält er von einem eigenen Quarzoszillator.

7.1.6 SERBUS-Interface

Für die Ansteuerung und Programmierung der einzelnen Baugruppen wird ein von R&S eigens entwickeltes serielles Bussystem (SERBUS) verwendet. Hierfür existieren bisher zwei Standard-ASIC's (SERBUSÄM und SERBUSÄD).
Auf dem Rechner befindet sich der Bus-Master-Baustein (SERBUSÄM / D87). Er wird wortweise programmiert und mit einer Taktfrequenz von 32MHz betrieben. Zur seriellen Datenübertragung an die Baugruppen wird 4MHz verwendet.

7.1.7 RS232- / V.24-Interface

Dieses Interface ist mit dem Controller-IC 82510 (D85) realisiert. Die Pegelumsetzung von TTL auf RS232 erfolgt im Baustein LT1181 (D860).

7.1.8 Timer

Der Baustein uPD71054(D61) enthält drei 16-Bit Timer. Um lange Zeiten mit hoher Auflösung realisieren zu können, sind zwei dieser Timer kaskadiert (Timer1 und Timer2). Als Eingangstakt stehen 1kHz für Timer0 und 1MHz für Timer1/2 zur Verfügung.

7.1.9 Interruptcontroller

Als Interruptcontrollers ist der Baustein 82C59 (D86) eingesetzt. Folgende Interruptquellen sind angeschlossen, wobei jeder Eingang als dynamisch oder statisch verwendet werden kann:

Interrupt-Eing.	Bedeutung
IR0	Trigger
IR1	Aux-Trigger
IR2	IEC-INT-P
IR3	T2-INT0
IR4	T2-INT2
IR6	T2-RS232
IR7	DONE

Alle statischen Interrupts werden an D830 zu einem zusammengefaßt und auf den Interrupteingang IR5 gelegt:

1. - SERBUS-INT1
2. - SERBUS-INT2
3. - ACFAIL (Powerfail vom Netzteil)
4. - SERBUS-ACT-REQ.

Alle Interrupts sind maskierbar. Die statischen Interrupts 3. und 4. sind an der Quelle und die verbleibenden können über das Portregister D810 maskiert werden.

7.1.10 ACFAIL,SYSRESET

Das Signal ACFAIL wird im Netzteil erzeugt und ist eines der statischen Interruptsignale, welche nicht an der Quelle maskierbar ist. Die Maskierung erfolgt wie bei vorherigem Punkt beschrieben.

SYSRESET (ebenfalls vom Netzteil) wird über D106 an das ASIC CLKGEN geführt und löst dort die Resetschaltung aus. Zugleich wird über R167 und V4 der Kondensator C23 entladen. Wird das Signal SYSRESET wieder HIGH, lädt sich C23 über R174 auf und gibt nach Erreichen der Schwellspannung von D106 den Reseteingang des CLKGEN wieder frei.

7.1.11 Verarbeitung externer Triggersignale

(TRIGGER, AUX-TRIG) Polarität & Triggerart (dyn./stat.) wählbar

Die Wahl der Triggerart erfolgt durch Programmierung des Interruptcontrollers 82C59. Die Polarität des Triggersignales kann für beide Triggersignale getrennt an Port D810 eingestellt werden und erfolgt durch EXOR-Verknüpfung des Portsignales mit dem Triggersignal (D840).

7.1.12 LCD-Interface

Zur Ansteuerung des LC-Displays wird der LCD-Controller SED1351F (D90) von SEIKO EPSON verwendet. Der Bildspeicher besteht aus den beiden SRAM's D960 und D970. Dieser Speicher ist ausreichend für vier Bildschirmseiten (640 x 200).
Um eine lineare Adressierung der Pixel (Pixel 0 ist LSB der untersten Adresse) zu erhalten, wurde der Datenbus an D90 byteweise in sich gespiegelt.

Zur Erhöhung der Treiberfähigkeit und zur Isolation des Bausteines D90 werden die Daten- und Clock-Signale für das LCD über D980 geführt.

7.1.13 Helligkeits-und Kontrasteinstellung für LCD

Leiterplatte: Drehgeber (1035.5592.01)

Die Helligkeitseinstellung erfolgt über die Eingangsspannung des DC/ACÄWandlers für die CFL-Beleuchtung. Die Eingangsspannung für diesen Wandler darf im Bereich von +6V bis +10V liegen. Höhere Spannung bedeutet höhere Helligkeit. Die Spannungsregelung erfolgt mittels eines LM317T (N50), und die Einstellung der Ausgangsspannung wird mit R990 vorgenommen.
Beim Einschalten des Gerätes ist es aber für ein sicheres Zünden der Leuchtstoffröhren nötig, die Eingangsspannung des Wandlers auf +10V zu bringen. Hierzu dient die Schaltung aus N51 und V52, die nach dem Einschalten kurzzeitig +10V zur Verfügung stellt.
Zum Verbessern der Störabstrahlung des AC/DC Wandlers bzw. der Leuchtstoffröhren kann mit V48 die Beleuchtung ausgeschaltet werden.
Die Einstellung des Kontrastes erfolgt über die negative Versorgungsspannung VEE des LC-Displays. Diese Spannung wird mittels eines Switch-Capcitor-Voltage-Converters mit Regler (LT1054/N70) aus +15V erzeugt und kann mittels R995 im Bereich von -15V bis -22V eingestellt werden.
Zur Filterung der Störungen des DC/AC-Wandlers und des Converters LT1054 befinden sich noch zwei LC-Filter in pi-Form auf dieser Leiterplatte.

7.1.14 Drehknopfinterface

Bei jedem Pegelwechsel des Signales KNOB2 (CLK) wird über die Laufzeitkette aus D566C/D und D562B/C am EXNOR-Gatter D566B ein LOW-Puls erzeugt. Mit diesem Puls wird die Richtungsinformation im Flip-Flop D565B gespeichert und mit D565A ein Interrupt ausgelöst.

7.1.15 Anschluß für die Tastaturmatrix

Die Spaltenleitungen der Tastaturmatrix werden am Register D550, die Zeilenleitungen am Port D560 angeschlossen.
Solange keine Taste betätigt wird,liegen die angeschlossenen Zeilenleitungen über die Pull-Up-Widerstände R90...R96 auf HIGH-Potential. Die Spaltenleitungen werden von den Registerausgängen auf LOW-Potential gehalten. Wird nun eine Taste betätigt, wird die zugehörige Zeilenleitung auf LOW-Potential gebracht. Nach Entprellung wird ein Interrupt erzeugt, woraufhin nacheinander die Spalten einzeln auf LOW-Potential gelegt werden und an Hand des Pegels erkannt wird, welche Taste betätigt wurde.

7.1.16 Diagnose A/D-Wandler

mit 12-Bit-Wandler und zwei Diagnoseeingängen (±5V & ±15V)

Die beiden Diagnoseeingänge und einige Meßpunkte des Rechners werden über den Multiplexer D700, Impedanzwandler N701 und Eingangsverstärker dem A/D-Wandler D704 zugeführt.
Folgende Spannungen für Vollaussteuerung des A/D-Wandlers sind einstellbar: ±15V, ±5V und ±1V.

Die Wandlungszeit (max. 9us) zeigt der ADC am BUSY-Ausgang an, welcher über D570 (Port1) eingelesen werden kann.
Für Zwecke der Selbstdiagnose können folgende Spannungen mit dem Selbstdiagnosewandler gemessen werden:

die Spannung des X-Ausgangs
die Referenzspannung des D/A-Wandlers
die Batteriespannung

Es existiert zudem die Möglichkeit an Stelle der Kurzschlußbrücke X85 Meßkabel anzuschließen und damit beliebige Meßpunkte an den A/D-Wandler anzuschließen. Dabei ist allerdings zu beachten, daß die Meßspannung ±15V nicht überschreitet.

7.1.17 X-Ausgang

Der X-Ausgang erzeugt beim Sweep ein Ausgangssignal von 0V (Sweepanfang) bis 10V (Sweepende), welches zur Ansteuerung von externen Geräten genutzt werden kann. Dieses Signal wird vom Prozessor durch entsprechende Einstellung des D/A-Wandlers D706 in Abhängigkeit vom Sweep generiert. Dem Schutz vor Überspannung dienen der Widerstand R223 und die Dioden V10.

7.1.18 Varianten-/Änderungszustandserkennung

Dazu dient der Port D4. Je nach Bestückung der Widerstände R592 bis R594 können die verschiedenen Varianten kodiert werden. R595 bis R598 sind zur Kodierung des Änderungszustandes vorgesehen.

7.1.19 Steuersignale, Tastenbeep

Die Signale MODCNTL-OUT und MODCNTL-IN ermöglichen eine Synchronisation zwischen dem Signalprozessor der Baugruppe Modulationsgenerator und dem Prozessor.
Die Ausgangssignale BLANK und MARKER sowie das Eingangssignal SWEEP-STOP dienen zur Steuerung- und Synchronisation von und mit externen Geräten.
Das Ausgangsport D213 liefert das Steuersignal (LAMP-OFF) für die Beleuchtungsabschaltung der Leuchtstoffröhren.
Zum Erzeugen eines Tastenbeep ist der Piezosummer H200 vorgesehen. Das Port D301 schaltet über D310 die Tonfrequenz 1kHz an V287.

7.1.20 Standby Schalter und -LED

Der an der Frontseite des Generators angebrachte Standbyschalter wird direkt am Rechner angeschlossen und über das gemeinsame Flachbandkabel aufs Motherboard herausgeführt.
Die Standby-LED wird so zwischen +15V und VS12-P geschaltet, daß bei fenlenden +15V ein Strom von VS12-P über die LED auf die virtuelle Masse der +15V fließen kann.

7.2 Meßgeräte und Hilfsmittel

Oszilloskop	100MHz	z.B. BOL
DC-Multimeter	0....+-30V, Ri>1MOhm	z.B. UDL33
DC-Spannungsquelle	..10V	z.B. NGT20

7.3 Fehlersuche

Standby-LED bleibt dunkel	Prüfen der Standby-Spannung an X312.5
Nach dem Einschalten bleibt LC Display dunkel	Prüfen der Spannung des DC/AC-Wandlers nach 7.4.1
Keine Kontrasteinstellung möglich	Prüfen der Kontrastspannung nach 7.4.2
Drehgeber funktioniert nicht	Prüfen der Pulse des Drehgebers nach 7.4.3
Keine Anzeige nach dem Einschalten	Prüfen des RESET-Signales nach 7.4.4
	Prüfen des ACFAIL-Signales nach 7.4.4
Keine Spannung an X-AXIS	Prüfen des Ausganges X-AXIS mit Diagnose nach 7.4.6
	Prüfen der Referenzspannung mit Diagnose nach 7.4.6
Keine Datenspeicherung nach de Geräteabschalten	Prüfen der RAM-Spannung mit Diagnose nach 7.4.6

7.4 Prüfen und Abgleich

7.4.1 Prüfen der Versorgungsspannung des DC/AC-Wandlers

Baugruppe Drehgeber:
Am Stecker X6.4 ist in Abhängigkeit der Stellung des Helligkeitsreglers an der Gerätefrontseite die DC-Spannung zu messen: Sollwert: 6V...10V.

7.4.2 Prüfen der Kontrastspannung

Baugruppe DREHGEBER:
Am Stecker X7.5 und X10.5 ist in Abhängigkeit der Stellung des Kontrastreglers an der Gerätefrontseite die DC-Spannung zu messen: Sollwert: -15V...-22V.

7.4.3 Prüfen des Drehgebers

Baugruppe RECHNER:
Oszilloskop an X35.9 und X35.11 anschließen.
Drehgeber drehen. Es müssen 2 zeitversetzte Signale zu messen sein.

7.4.4 Prüfen des RESET und ACFAIL-Signales

Baugruppe RECHNER:
Oszilloskop an X31.35 und D106 PIN2 anschließen.
Unmittelbar nach dem Einschalten des Gerätes muß beim ACFAIL-Signal ein L->H-Übergang stattfinden. Nach ca. 200-300ms muß das RESET-Signal (RES-N) den Pegelwechsel L->H zeigen. Beide Signale müssen bei allen Bedienzuständen den H-Pegel beibehalten.

7.4.5 Prüfen des Diagnosezweiges

- Einstellungen: **TPOINT 4**
- An X85 eine DC-Spannung von 0,5V einspeisen.
- Prüfen der Spannung an P710: 0,5V und P730: 1,5V.

7.4.6 Prüfen und Auslesen der Diagnosemeßpunkte

TPOINT	Spannung	Bedeutung
0	0mV...50mV	Referenzpunkt
1	-15V...15V	DIAG -15V
2	-15V...15V	DIAG -5V
3	0V...10V	X-AXIS
4	-15V...15V	Voltmeter
6	4.9V...5.1V	Referenzspannung X-D/A
7	3.2V...4.0V	Batteriespannung

7.4.7 Prüfen der Position der Steckbrücken

Steckbrücke	Position	Bemerkung
X105	1 - 2	Clock (CPU)
X300	1 - 2	Batterie
X900	1 - 2	+5V-Spannung
X85	1 - 2	Voltmeter
X800	2 - 3	Timer-Int
X700	1 - 2	Clock (RS232)

7.5 Zerlegung und Zusammenbau

Die 4 Schrauben an der Geräte-Vorderseite entfernen. Das Modul vorsichtig nach vorne klappen, um die Kabelverbindungen W20, W313 und W314 lösen zu können. Nach Trennen von W31 (Flachbandkabel z. Motherboard) kann das Frontmodul herausgenommen werden. Der rückseitige Blechdeckel ist mit 6 Schrauben befestigt. Die Platine RECHNER kann nach Entriegeln der Buchsen X36, X37 und Trennen der beiden Folien sowie der Buchse an X312 vorsichtig herausgenommen werden. Abschließend das Flachbandkabel W35 zur Leiterplatte DREHGEBER lösen.

Ausbau der LP DREHGEBER: Den Drehknopf abnehmen, und die Verbindung an X6 (z. DC/AC-Wandler) und X7 (Flachfolie z. LCD) trennen. 12pol. Buchsenhalter des Kabels W10 am LCD abziehen. Die LP kann nach Abschrauben von 4 Schrauben herausgenommen werden.

Ausbau des LCD: Kabel W10 sowie Flachfolie zur LP DREHGEBER an X7 abziehen. 4pol. Steckverbindung vom DC/AC-Wandler zur CFL-Beleuchtung auftrennen. Das LCD ist mit 4 Schrauben am Gußgehäuse befestigt und kann komplett herausgenommen werden.

Der Zusammenbau geschieht in umgekehrter Reihenfolge. Vor dem Zuschrauben des Deckels ist auf den korrekten Sitz der Baugruppe RECHNER zu achten, insbesondere auf das Anliegen der Dichtschnur.

7.6 Externe Schnittstellen

7.6.1 Schnittstelle Rechner

Pin	Name	Ein/Ausgang	Herkunft/Ziel	Wertebereich	Signalbeschreibung
X31.1 ...6	VD-5P	Eingang	A2, POWS	5.10V...5.25V max. 3000mA	Versorgungsspannung digital
X31.11, 12	VA15-P	Eingang	A2, POWS	14.7V...15.9V max. 660mA	Versorgungsspannung analog
X31.15	VA15-N	Eingang	A2, POWS	-15.9V...-14.7V max. 50mA	Versorgungsspannung analog
X31.27	VS12-P	Eingang	A2, POWS	11.6V...12.4V	Standby-spannung
X31.7,8 9,10,13 14,16					Masse digital
X31.19, 20					Masse analog
X31.26 X312.2	POWER-SWITCH	Ausgang	A2, POWS		Schalterkontakt
X31.25 X312.1	POWER-SWITCH-GND	Ausgang	A2, POWS		Schalterkontakt
X312.5	STBY-LED1	Ausgang	A2, POWS		Anode Standby-LED
X312.3	STBY-LED2	Eingang	A2, POWS		Kathode Standby-LED
X312.4	N.C.				Codierung
X31.40	SERBUS-CLK	Ausgang		HCMOS-Pegel	Serbus-Clock
X31.39	SERBUS-DAT	bidir.		HCMOS-Pegel	Serbus-Daten
X31.37	SERBUS-SYNC	Ausgang		HCMOS-Pegel	Serbus-Synchronisation
X31.38	SERBUS-INT	Eingang		HCMOS-Pegel	Serbus-Interrupt
X31.28	RES-P	Ausgang		HCMOS-Pegel	Reset
X31.44	DIAG-5V	Eingang		-5V...5V	Diagnose
X31.43	DIAG-15V	Eingang		-15V...15V	Diagnose
X31.42	TRIGGER	Eingang	Rückwand	HCMOS-Pegel	Trigger
X31.41	AUX-TRIG	Eingang	Rückwand	HCMOS-Pegel	Trigger
X31.36	SYSRESET	Eingang	A2, POWS	HCMOS-Pegel	System-Reset
X31.35	ACFAIL	Eingang	A2, POWS	HCMOS-Pegel	Powerfail
X31.34	BLANK	Ausgang	Rückwand	HCMOS-Pegel	Steuersignal
X31.33	MARKER	Ausgang	Rückwand	HCMOS-Pegel	Steuersignal
X31.32	SWEEP-STOP	Eingang	Rückwand	HCMOS-Pegel	Steuersignal
X31.30	MODCTRL-OUT	Ausgang	A5, MGEN X5.2	HCMOS-Pegel	Steuerung Modulationsgenerator
X31.31	MODCTRL-IN	Eingang	A5, MGEN X5.1	HCMOS-Pegel	Steuerung Modulationsgenerator
X31.45	X-AXIS	Ausgang	Rückwand	0...10V	Frequ.prop. Spannung
X31.47	DONE	Eingang		HCMOS-Pegel	Interrupt-Signal
X31.17,18 21..24	INP00.. ..INP05	Eingang		HCMOS-Pegel	
X31.46	UBEXT	Eingang		0..5V	ext. Batt.anschluß
X37.1 ...7	RET0.. RET6	Eingang	Drehgeber	HCMOS-Pegel	Tastatur
X37.8 ...13	SCAN0 ...SCAN5	Ausgang	Drehgeber	HCMOS-Pegel	Tastatur
X36.1 ..13	"GND"			1kOhm Pulldown	Tastatur
X33.6	CTS	Eingang	Rückwand	RS232-Pegel	Serielle Schnittstelle
X33.2	RXD	Eingang	Rückwand	RS232-Pegel	Serielle Schnittstelle
X33.5	TXD	Ausgang	Rückwand	RS232-Pegel	Serielle Schnittstelle

X33.4,7	DTR	Ausgang	Rückwand	RS232-Pegel	Serielle Schnittstelle
X33.9					Masse digital
X34.1	DIO-1	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.3	DIO-2	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.5	DIO-3	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.7	DIO-4	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.2	DIO-5	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.4	DIO-6	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.6	DIO-7	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.8	DIO-8	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.9	EOI	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.10	REN	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.11	DAV	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.13	NRFD	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.15	NDAC	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.17	IFC	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.19	SRQ	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.21	ATN	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.12,14 16,18,20, 22,24					Masse analog
X35.2,4, 6,8	VA15-P	Eingang	DREHGEBER	14.7V...15.9V max. 650mA	Versorgungsspannung analog
X35.18	+5V	Eingang	DREHGEBER	5.1V...5.3V max.20mA	Versorgungsspannung digital
X35.1,20, 21,23,25					Masse
X35.16	LAMPOFF	Eingang	DREHGEBER	HCMOS-Pegel	Steuerung Beleuchtung
X35.3	POT1	bidir.	DREHGEBER		Anschl.1 d. Kontrastreglers
X35.5	POT2	bidir.	DREHGEBER		Anschl.2 d. Kontrastreglers
X35.7	POT3	bidir.	DREHGEBER		Anschl.3 d. Kontrastreglers
X35.10	POT4	bidir.	DREHGEBER		Anschl.1 d. Helligkeitsreglers
X35.12	POT5	bidir.	DREHGEBER		Anschl.2 d. Helligkeitsreglers
X35.14	POT6	bidir.	DREHGEBER		Anschl.3 d. Helligkeitsreglers
X35.9	KNOB1	Eingang	DREHGEBER	HCMOS-Pegel	Anschl.1 d. Drehgebers
X35.11	KNOB2	Eingang	DREHGEBER	HCMOS-Pegel	Anschl.2 d. Drehgeber
X35.22	LCD-D0	Ausgang	DREHGEBER	HCMOS-Pegel	Daten LCD
X35.24	LCD-D1	Ausgang	DREHGEBER	HCMOS-Pegel	Daten LCD
X35.26	LCD-D2	Ausgang	DREHGEBER	HCMOS-Pegel	Daten LCD
X35.13	LCD-D3	Ausgang	DREHGEBER	HCMOS-Pegel	Daten LCD
X35.17	LCD-CP1	Ausgang	DREHGEBER	HCMOS-Pegel	Clock1 LCD
X35.19	LCD-CP2	Ausgang	DREHGEBER	HCMOS-Pegel	Clock2 LCD
X35.15	LCD-CS	Ausgang	DREHGEBER	HCMOS-Pegel	Chip-Select LCD

7.6.2 Schnittstelle Drehgeber

Pin	Name	Ein/Ausgang	Herkunft/Ziel	Wertebereich	Signalbeschreibung
X5.2,4 X5.6,8	+15V	Eingang	RECHNER	14.7V...15.9V max. 600mA	Versorgungsspannung analog
X5.18	+5V	Eingang	RECHNER	5.1V..5.3V max.20mA	Versorgungsspannung digital
X5.1,20, 21,23,25					Masse
X6.4	V-DC/AC	Ausgang	DC/AC-Wandler	6V...10V max. 550mA	Versorgungsspannung Beleuchtung
X6.1	GND-DC/AC		DC/AC-Wandler		
X10.1	VEE-LCD	Ausgang	LCD	-15V...-22V max. 20mA	Kontrastspannung
X10.2	VDD-LCD	Ausgang	LCD	5.1V...5.3V max. 20mA	Versorgungsspannung digital
X7.6	VSS-LCD				Masse
X5.22 X7.4	LCD-D0	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Daten LCD
X5.24 X7.3	LCD-D1	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Daten LCD
X5.26 X7.2	LCD-D2	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Daten LCD
X5.13 X7.1	LCD-D3	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Daten LCD
X5.15 X7.10	LCD-CS	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Chip-Select LCD
X5.17 X7.8	LCD-CP1	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Clock1 LCD
X5.19 X7.9	LCD-CP2	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Clock2 LCD
X5.16	LAMPOFF	Eingang	RECHNER	HCMOS-Pegel	Steuerung Beleuchtung
X5.9	KNOB1	Ausgang	RECHNER	O.C. 2,2kOhm	Anschl.1 d. Drehgebers
X5.11	KNOB2	Ausgang	RECHNER	O.C. 2,2kOhm	Anschl.2 d. Drehgebers
X5.3,5,7	POT1,2,3	bidir.	RECHNER		Anschl.1,2,3 d. Kontrastreglers
X5.10,12, 14	POT4,5,6	bidir.	RECHNER		Anschl.1,2,3 d. Helligk.reglers

7.6.3 Schnittstelle LCD

Pin	Name	Ein/Ausgang	Herkunft/Ziel	Wertebereich	Signalbeschreibung
CONN2.5	VEE-LCD	Eingang	DREHGEBER	-15V...-22V	Kontrastspannung
CONN2.7	VDD-LCD	Eingang	DREHGEBER	5.1V...5.3V	Versorgungsspannung digital
CONN1.6	VSS-LCD				Masse
CONN1.4	LCD-D0	Eingang	DREHGEBER	HCMOS-Pegel	Daten LCD
CONN1.3	LCD-D1	Eingang	DREHGEBER	HCMOS-Pegel	Daten LCD
CONN1.2	LCD-D2	Eingang	DREHGEBER	HCMOS-Pegel	Daten LCD
CONN1.1	LCD-D3	Eingang	DREHGEBER	HCMOS-Pegel	Daten LCD
CONN1.10	LCD-CS	Eingang	DREHGEBER	HCMOS-Pegel	Chip-Select LCD
CONN1.8	LCD-CP1	Eingang	DREHGEBER	HCMOS-Pegel	Clock1 LCD
CONN1.9	LCD-CP2	Eingang	DREHGEBER	HCMOS-Pegel	Clock2 LCD

ROHDE&SCHWARZ

SERVICE INSTRUCTIONS

Front Module with Controller VAR 06

1035.5440

Variation Declaration of the entire Module:

1035.5440.02 SMP

1035.5440.03 SME

1035.5440.04 SMT

1035.5440.05 SMIQ

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PART LIST
COORDINATES LIST
CIRCUIT DIAGRAM
LAYOUT DIAGRAM

7. Testing and Repair of the Board

Caution ! ! In the Front Module many data are stored, which are necessary for operation. All data contained in the RAM may be reconstructed by the unit itself. To reconstruct data in the flash EPROM additional tools are necessary. If there is some danger to loose data of the flash EPROM, be shure, you can

1) load a new firmware,

2) perform a level calibration (refer to section 6.4 of service manual),

3) restore calibration data or calibrate the Reference Oscillator (refer to section 2.11.8 of operating manual),

4) reconstruct the operational data in the menue UTILITIES/DIAG/PARAM.

To do 3) and 4) the concerned data have to be noted down before work on the module. To restore data of reference oscillator, you got to unlock password protection level 2 (refer to section 2.11.7 of operating manual). The password is 250751. After this in the menue UTILITIES/CALIB/REF OSC the noted calibration data can be keyed in. To construct operational data (4), password protection level 3 is to be unlocked. Please contact your R&S representative to get the password. The menue UTILITIES/DIAG/SET PARAM will appear and allow to key in the noted data.

7.1 Function Description

The front module contains the following components: controller, shaft encoder, keyboard and LC display.
The controller must provide the following functions and features:

- CPU: 80960SB-16
- RAM with battery-backup
- 512K-Byte RAM with battery-backup
- Battery test
- Firmware in flash-EPROMs which can be updated
- IEEE-bus interface
- SERBUS interface
- RS232 / V.24 interface
- Timers
- Interrupt controller
  all interrupts maskable either at the source or at the interrupt controller
- ACFAIL of the power supply triggers maskable interrupt
- Processing of external trigger signals
  (TRIGGER, AUX-TRIG) polarity & trigger type (dyn./stat.) selectable
- LCD interface
- brightness and contrast control for LCD
- spinwheel interface
- connector for keyboard matrix
- self diagnostics with 12-bit converter and
  two diagnostic inputs (±5V & ±15V)
- X-output (0 to 10 V)
- identification of model/variation

- various control lines for other modules
  (MODCTRL-OUT, MODCTRL-IN)
- digital output and input signals
  (BLANK, MARKER, SWEEP-STOP, KEYBEEP)
- SYS-RESET by the power supply causes system reset
- standby switch and standby LED

7.1.1 CPU: 80960SB-16

Use of the processor 80960 (clock freq.: 16MHz) requires defined RESET and clock signals for the complete controller system.This signal-generation is realized by an ASIC (CLOCKGEN D3). Various clock frequencies used in the system are derived from this ASIC. Since the bus-interface of the 80960 is designed for BURST access, several PLDs have been used (D300, D402, D540, D600, D800, D950). The latter convert the BURST access into the corresponding control for the components connected. Besides, they generate the READY signal for adapting the access speed. The various READY signals are joined to a common signal for the processor via an AND logic at D103. The processor 80960 provides a multiplexed address and data bus. During the address cycle of the CPU, the addresses A4 to A15 are loaded into the components D204, D205 and D216 and are then available during the following data-/wait-cycles and the final recovery-cycle.
The two data-bus drivers D208 and D209 are required to achieve an isolation of the data bus from the multiplexed data-/address bus of the processor. This is necessary when using slow peripheral components.

7.1.2 512K-Byte RAM with Battery-backup

This memory is composed of eight 1Mbit SRAM components (D302 to D309) in four banks of 128K words, each.
(1 word=16bits). The access to this memory is disabled by the signal EN-MEM-P, whenever the reset signal is active or the supply voltage drops below 4 V (V390, V391). This check of the supply voltage is intended for a sudden power failure, without prior generation of the SYSRESET signal by the power supply.
The circuit consisting of the transistors V11 and V2 and the diode V7 initiates switchover from VBATT to +5V, as soon as the +5V-supply voltage exceeds the battery voltage.

7.1.3 Battery Test

The charge of the battery can be tested by connecting a load resistor of 39,2 kOhm to the battery by means of the REED relay, which is controlled by the signal TST-BATT. The voltage at the resistor is applied to the self-diagnostics circuit and thus informs on the discharge degree of the battery.

7.1.4 FLASH-EPROMs (Firmware Update)

The use of FLASH-EPROMs allows for making firmware updates without external access. Two components D1,D2, type 28F016 (2M-words), are therefore provided.
The voltage VPP required for programming is generated from +15V by the component D400. This linear controller can be switched on and off by means of the signal VPP-ON.
The firmware update is realized via an RS232 interface at the rear panel of the instrument.
The initial program loader is contained in the BOOT-EPROM (D301). This BOOT-EPROM additionally allows for fitting the FLASH-EPROMs as unprogrammed standard components.

7.1.5 IEEE-Bus Interface

The component TNT4882C (D60) is used as IEEE-bus controller. The complete controller capability of the IEEE-bus can be realized. It is provided with an 40MHz clock frequency via a separate quartz oscillator.

7.1.6 SERBUS-Interface

A serial bus system (SERBUS) developped by R&S is used for control and programming of the individual modules. Two standard ASICs are already available (SERBUS-M and SERBUS-D).
The controller accomodates the bus-master component (SERBUS-M / D87). It is programmed in words and operated at a clock frequency of 32 MHz. 4 MHz are used for serial data transmission to the boards.

7.1.7 RS232- / V.24-Interface

This interface is implemented by controller IC 82510 (D85). Level conversion from TTL to RS232 is carried out in component LT1181 (D860).

7.1.8 Timer

The component uPD71054 (D61) contains three 16-bit timers. Two of them (timers 1 and 2) are cascaded to achieve a high resolution for long periods of time. The input clock is 1 kHz for timer 0 and 1 MHz for timers 1 and 2.

7.1.9 Interrupt Controller

The interrupt controller is component 82C59 (D86) with the following interrupt sources connected. Each input can be used as a dynamic or static input.

Interrupt input	Definition
IR0	Trigger
IR1	Aux-Trigger
IR2	IEC-INT-P
IR3	T2-INT0
IR4	T2-INT2
IR6	INT-RS232
IR7	DONE

All static interrupts are combined to one interrupt at D830 and applied to interrupt input IR5.

1. - SERBUS-INT1
2. - SERBUS-INT2
3. - ACFAIL (powerfail)
4. - SERBUS-ACT-REQ.

All interrupts are maskable. The static interrupts 3 and 4 are maskable at the source and the others via port register D810.

7.1.10 ACFAIL,SYSRESET

The signal ACFAIL is generated in the power supply and belongs to those interrupt signals which are not maskable at the source. Masking is carried out as described under 7.1.9. SYSRESET (generated by the power supply, too) is applied to the ASIC CLKGEN via D106 and initiates the reset. Simultaneously, the capacitor C23 is discharged via R167 and V4. When the signal SYSRESET assumes HIGH level again, C23 charges via R174 and, subsequent to reaching the threshold voltage of D106, enables the reset input of CLKGEN again.

7.1.11 Processing of External Trigger Signals

(TRIGGER, AUX-TRIG) polarity & trigger type(dyn./stat.) are selectable

Selection of the type of trigger is made by programming the interrupt controller 82C59. The polarity of the trigger signal can be set individually for both trigger signals at port D810 and is generated by an EXOR logic combining the port signal and the trigger signal(D840).

7.1.12 LCD Interface

The LCD controller SED1351F (D90) of SEIKO EPSON is used to address the LC display. The display buffer/video RAM consists of the two SRAMs D960 and D970 and offers memory space for four screen pages (640 x 200).
Linear addressing of the pixels (pixel 0 is LSB of the lowest address) is achieved by mirroring the data bus at D90 byte by byte.

The data and clock signals for the LCD are routed via D980 to increase the driver capability and to isolate the component D90.

7.1.13 Brightness and Contrast Control for LCD

PC board: Shaft Encoder (1035.5592.01)
Brightness is set via the input voltage of the DC/AC converter for the CFL illumination. The input voltage for this converter may vary between +6V and +10V. Increase of voltage means increase of brightness. The voltage is controlled by means of LM317T (N50), and the output voltage is set using R990.
The input voltage of the converter must assume +10V with switch-on of the instrument in order to ensure ignition of the fluorescent tubes. The circuit consisting of N51 and V52. which shortly provides +10V following switch-on, is available for this purpose. The illumination can be switched off by means of V48 to improve the interference radiation of the AC/DC converter and of the fluorescent tubes.
The contrast is set via the negative supply voltage VEE of the LC display. This voltage is derived from +15V by means of a switch-capacitor-voltage-converter with controller (LT1054/N70) and can be set in the range from -15V to -22V using R995.
Two additional pi-type LC filters are contained on the board for filtering of the interferences radiated by the DC/AC converter and the converter LT1054.

7.1.14 Knob Interface

With each change of level of the signal KNOB2 (CLK), a LOW pulse is generated via the runtime chain consisting of D566C/D and D562B/C at the EXNOR-gate D566B. This pulse is used to store the direction information in the flip-flop D565B and to trigger an interrupt using D565A.

7.1.15 Connector for the Keyboard Matrix

The vertical lines are connected to the register D550, the horizontal lines to the port D560.
If no key is pressed the connected horizontal lines are applied to HIGH potential via the pull-up resistors R90 to R96. The vertical lines are kept at LOW potential by the register outputs. As soon as a key is pressed, the associate horizontal line assumes LOW potential. Subsequent to debouncing, an interrupt is generated, which allows for applying the vertical lines individually to LOW potential. The level indicates, which key was pressed.

7.1.16 Diagnostics A/D Converter

including 12-bit converter and two diagnostic inputs (±5V & ±15V)

The two diagnostic inputs and a few test points of the controller are applied to the A/D converter D704 via the multiplexer D700, the impedance converter N701 and the input amplifier.
The following voltages can be set for maximum range of the A/D converter: +-15V, +-5V and +-1V.
The conversion time (max. 9 us) is indicated by the BUSY output, which can be read in via D570 (port1).
The following voltages can be measured using the self-diagnostics converter for self-diagnostic purposes:

the voltage at the X-output
the reference voltage of the D/A converter
the battery voltage

Moreover, test cables can be connected instead of the shorting jumper X700 and thus, any test point can be connected to the A/D converter. Make sure, that the test voltage does not exceed +-15V.

7.1.17 X-Output

With sweeping, the X-output generates an output signal of 0V (sweep start) to 10V (end of sweep), which can be used to control external devices. This signal is generated by the processor by setting the D/A converter D706 correspondingly, depending on the sweep. The resistor R223 and the diodes V10 are provided for overvoltage protection.

7.1.18 Identification of Variant and Revision

The port D4 is provided for identification of the module. The variant of the module is coded by the configuration of the resistors R592 to R594, the revision by R595 through R598.

7.1.19 Control Signals, Key Beep

The signals MODCNTL-OUT and MODCNTL-IN allow for synchronization between the signal processor of the modulation generator module and the processor.
The output signals BLANK and MARKER as well as the input signal SWEEP-STOP are used for control and synchronization of external devices.
The output port D213 supplies the control signal (LAMP-OFF) for switching off the tubular fluorescent lamps.
The piezo-buzzer H200 is provided for generation of a key beep.
The port D301 switches the 1-kHz tone frequency to V287 via D310.

7.1.20 Standby Switch and LED

The standby switch fitted to the front panel of the generator is connected directly to the controller and routed to the motherboard via the common ribbon cable.
The standby LED is switched between +15V and VS12-P such that in case of a cut of +15V a current may flow from VS12-P via the LED to the virtual ground of the +15V.

7.2 Test Instruments and Utilities

Oscilloscope	100MHz	e.g., BOL
DC multimeter	0 to +-30V, Ri>1MOhm	e.g., UDL33
DC voltage source	..10V	e.g., NGT20

7.3 Troubleshooting

Standby LED does not light up	Check the standby voltage at X312.5
Subsequent to switch-on, the LC-Display remains dark	Check the voltage of the DC/AC converter acc.to 7.4.1
Setting of contrast not possible	Check the contrast voltage acc. to 7.4.2
Shaft encoder does not work	Check the pulses of the shaft encoder acc. to 7.4.3
No display following switch-on	Check the RESET signal acc. to 7.4.4
	Check the ACFAIL signal acc. to 7.4.4
No voltage at X-AXIS	Check the output X-AXIS using diagnostics acc. to 7.4.6
	Check the reference voltage using the diagnostics acc. to 7.4.6
No storage of data after switching off the instrument	Check the RAM voltage using diagnostics acc. to 7.4.6

7.4 Testing and Adjustment

7.4.1 Checking the Supply Voltage of the DC/AC Converter

Shaft encoder module:
Measure the DC voltage at the connector X6.4 depending on the position of the brightness control at the front panel of the instrument: rated value: 6V to 10V.

7.4.2 Checking the Contrast Voltage

SHAFT ENCODER module:
Measure the DC voltage at the connectors X7.5 and X10.5 depending on the position of the contrast controller at the front panel of the instrument: rated value: -15V to -22V.

7.4.3 Checking the Shaft Encoder

CONTROLLER module:
Connect an oscilloscope to X35.9 and X35.11.
Turn the shaft encoder. There must be 2 signals with different timing.

7.4.4 Testing the RESET and the ACFAIL Signal

CONTROLLER module:
Connect an oscilloscope to X31.35 and D106 PIN2.
Just upon switching on the instrument, the level of the ACFAIL signal must change from L to H. This change of level must be indicated by the RESET signal (RES-N) after approx. 200 to 300 ms. Both signals must remain HIGH-level with all operating states.

7.4.5 Checking the Diagnostic Path

- Settings: **TPOINT 4**
- Apply a DC voltage of 0.5V to X700.
- Check the voltage at P710: 0.5V and P730: 1.5V.

7.4.6 Check and Readout of the Diagnostic Test Points

TPOINT	Voltage	Meaning
0	0mV to 50mV	Reference point
1	-15V to 15V	DIAG -15V
2	-15V to 15V	DIAG -5V
3	0V to 10V	X-AXIS
4	-15V to 15V	Voltmeter
6	4.9V to 5.1V	Reference voltage X-D/A
7	3.2V to 4.0V	Battery voltage

7.4.7 Checking the Position of Jumpers

Jumper	Position	Remark
X105	1 - 2	Clock (CPU)
X300	1 - 2	Battery
X900	1 - 2	+5V-voltage
X85	1 - 2	Voltmeter
X800	2 - 3	Timer-Int
X700	1 - 2	Clock (RS232)

7.5 Removal and Assembly

Remove the 4 screws at the front panel of the instrument. Carefully swing out the module to the front, in order to be able to disconnect the cable connections W20, W313 and W314. Subsequent to disconnecting W31 (ribbon cable to the motherboard), the front module can be withdrawn. The metal cover on the rear is fixed by 6 screws. The CONTROLLER board can be removed carefully after unlocking the sockets X316, X317 and separating the two foils as well as the socket at X312. Finally, disconnect the ribbon cable W315 to the ENCODER board.

Removal of the p.c.b. SHAFT ENCODER: remove the rotary knob, and disconnect the connection at X6 (to. DC/AC converter) and X7 (ribbon cable to LCD). Disconnect 12-pin connector support of the cable W10 from the LCD. The p.c.b. can be removed after unscrewing of 4 screws.

Removal of the LCD: disconnect the cable W10 as well as the flat foil to the PCB SHAFT ENCODER from X7. Disconnect the 4-pin connector between the DC/AC converter and the CFL illumination. The LCD is fixed to the cast housing by 4 screws and can be taken out completely.

Assembly has to be carried out in the reverse order. Prior to fixing the cover again, make sure that the PROCESSOR board has locked in place correctly and that the seal cord is correctly applied.

7.6 External Interfaces

7.6.1 Controller Interface

Pin	Name	Input/Output	Origin/Destin.	Specified range	Signal description
X31.1 to 6	VD-5P	Input	A2, POWS	5.10V to 5.25V max. 3000mA	Supply voltage, digital
X31.11 to 12	VA15-P	Input	A2, POWS	14.7V to 15.9V max. 660mA	Supply voltage, analog
X31.15	VA15-N	Input	A2, POWS	-15.9V to -14.7V max. 50mA	Supply voltage, analog
X31.27	VS12-P	Input	A2, POWS	11.6V to 12.4V	Standby-voltage
X31.7,8, 9,10,13 14,16					Ground, digital
X31.19,20					Ground, analog
X31.26 X312.2	POWER-SWITCH	Output	A2, POWS		Switch contact
X31.25 X312.1	POWER-SWITCH-GND	Output	A2, POWS		Switch contact
X312.5	STBY-LED1	Output	A2, POWS		Anode of standby-LED
X312.3	STBY-LED2	Input	A2, POWS		Cathode of standby-LED
X312.4	N.C.				Coding
X31.40	SERBUS-CLK	Output	HCMOS level		Serbus Clock
X31.39	SERBUS-DAT	bidir.	HCMOS level		Serbus data
X31.37	SERBUS-SYNC	Output	HCMOS level		Serbus synchronization
X31.38	SERBUS-INT	Input	HCMOS level		Serbus interrupt
X31.28	RES-P	Output	HCMOS level		Reset
X31.44	DIAG-5V	Input	-5V to 5V		Diagnostics
X31.43	DIAG-15V	Input	-15V to 15V		Diagnostics
X31.42	TRIGGER	Input	Rear panel	HCMOS level	Trigger
X31.41	AUX-TRIG	Input	Rear panel	HCMOS level	Trigger
X31.36	SYSRESET	Input	A2, POWS	HCMOS level	System reset
X31.35	ACFAIL	Input	A2, POWS	HCMOS level	Power fail
X31.34	BLANK	Output	Rear panel	HCMOS level	Control signal
X31.33	MARKER	Output	Rear panel	HCMOS level	Control signal
X31.32	SWEEP-STOP	Input	Rear panel	HCMOS level	Control signal
X31.30	MODCTRL-OUT	Output	A5, MGEN X5.2	HCMOS level	Modulation generator control
X31.31	MODCTRL-IN	Input	A5, MGEN X5.1	HCMOS level	Modulation generator control
X31.45	X-AXIS	Output	Rear panel	0 to 10V	Frequ.-prop. voltage
X31.47	DONE	Input		HCMOS level	Interrupt signal
X31.17,18 21 to 24	INP00 to INP05	Input		HCMOS level	
X31.46	UBEXT	Input		0 to 5 V	Ext. battery connector
X37.1 to 7	RET0 to RET6	Input	Shaft encoder	HCMOS level	Keyboard
X37.8 to 13	SCAN0 to SCAN5	Output	Shaft encoder	HCMOS level	Keyboard
X36.1 to 13	"GND"			1kOhm Pulldown	Keyboard
X33.6	CTS	Input	Rear panel	RS232 level	Serial interface
X33.2	RXD	Input	Rear panel	RS232 level	Serial interface
X33.5	TXD	Output	Rear panel	RS232 level	Serial interface
X33.4,7	DTR	Output	Rear panel	RS232 level	Serial interface
X33.9					Ground, digital

Pin	Name	Input/Output	Origin/Destin.	Specified range	Signal description
X34.1	DIO-1	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.3	DIO-2	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.5	DIO-3	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.7	DIO-4	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.2	DIO-5	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.4	DIO-6	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.6	DIO-7	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.8	DIO-8	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.9	EOI	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.10	REN	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.11	DAV	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.13	NRFD	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.15	NDAC	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.17	IFC	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.19	SRQ	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.21	ATN	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.12,14, 16,18,20, 22,24					Ground
X35.2,4 6,8	VA15-P	Input	SHAFT ENCODER	14.7V to 15.9V max. 650mA	Supply voltage, analog
X35.18	+5V	Input	SHAFT ENCODER	5.1V...5.3V max.20mA	Supply voltage, digital
X35.1,20 21,23,25					Ground
X35.16	LAMPOFF	Input	SHAFT ENCODER	HCMOS level	Illumination control
X35.3	POT1	bidir.	SHAFT ENCODER		Conn.1 of contrast control
X35.5	POT2	bidir.	SHAFT ENCODER		Conn.2 of contrast control
X35.7	POT3	bidir.	SHAFT ENCODER		Conn.3 of contrast control
X35.10	POT4	bidir.	SHAFT ENCODER		Conn.1 of brightness control
X35.12	POT5	bidir.	SHAFT ENCODER		Conn.2 of brightness control
X35.14	POT6	bidir.	SHAFT ENCODER		Conn.3 of brightness control
X35.9	KNOB1	Input	SHAFT ENCODER	HCMOS level	Conn.1 of the shaft encoder
X35.11	KNOB2	Input	SHAFT ENCODER	HCMOS level	Conn.2 of the shaft encoder
X35.22	LCD-D0	Output	SHAFT ENCODER	HCMOS level	Data LCD
X35.24	LCD-D1	Output	SHAFT ENCODER	HCMOS level	Data LCD
X35.26	LCD-D2	Output	SHAFT ENCODER	HCMOS level	Data LCD
X35.13	LCD-D3	Output	SHAFT ENCODER	HCMOS level	Data LCD
X35.17	LCD-CP1	Output	SHAFT ENCODER	HCMOS level	Clock1 LCD
X35.19	LCD-CP2	Output	SHAFT ENCODER	HCMOS level	Clock2 LCD
X35.15	LCD-CS	Output	SHAFT ENCODER	HCMOS level	Chip-Select LCD

7.6.2 Shaft encoder Interface

Pin	Name	Input/Output	Origin/Destination	Specified range	Signal description
X5.2	+15V	Input	Controller	14.7V to 15.9V	Supply voltage, analog
X5.6,8					
X5A.18	+5V	Input	CONTROLLER	5.1V..5.3V max.20mA	Supply voltage, digital
X5.1					Ground
X5.20,21,23,25					
X6.4	V-DC/AC	Output	DC/AC converter	6V...10V max. 550mA	Supply voltage for illumination
X6.1	GND-DC/AC	DC/AC-converter			
X10.1	VEE-LCD	Output	LCD	-15V to -22V max. 20mA	Contrast voltage
X10.2	VDD-LCD	Output	LCD	5.1V to 5.3V max. 20mA	Supply voltage, digital
X7.6	VSS-LCD				Ground
X5.22	LCD-D0	Input	CONTROLLER	HCMOS level	Data LCD
X7.4		Output	LCD		
X5.24	LCD-D1	Input	CONTROLLER	HCMOS level	Data LCD
X7.3		Output	LCD		
X5.26	LCD-D2	Input	CONTROLLER	HCMOS level	Data LCD
X7.2		Output	LCD		
X5.13	LCD-D3	Input	CONTROLLER	HCMOS level	Data LCD
X7.1		Output	LCD		
X5.15	LCD-CS	Input	CONTROLLER	HCMOS level	Chip-Select LCD
X7.10		Output	LCD		
X5.17	LCD-CP1	Input	CONTROLLER	HCMOS level	Clock1 LCD
X7.8		Output	LCD		
X5.19	LCD-CP2	Input	CONTROLLER	HCMOS level	Clock2 LCD
X7.9		Output	LCD		
X5.16	LAMPOFF	Input	CONTROLLER	HCMOS level	Illumination control of
X5.9	KNOB1	Output	CONTROLLER	O.C. 2,2kOhm	Connect.1 of the shaft encoder
X5.11	KNOB2	Output	CONTROLLER	O.C. 2,2kOhm	Connect.2 of the shaft encoder
X5.3	POT1,2,3	bidir.	CONTROLLER		Conn.1,2,3 of contrast contr.
X5.5					
X5.7					
X5.10	POT4,5,6	bidir.	CONTROLLER		Conn.1,2,3 of brightnes control
X5.12					
X5.14					

7.6.3 LCD Interface

Pin	Name	Input/Output	Origin/Destin.	Specified range	Signal description
CONN2.5	VEE-LCD	Input	SHAFT ENCODER	-15V to -22V	Contrast voltage
CONN2.7	VDD-LCD	Input	SHAFT ENCODER	5.1V to 5.3V	Supply voltage digital
CONN1.6	VSS-LCD				Ground
CONN1.4	LCD-D0	Input	SHAFT ENCODER	HCMOS level	Data LCD
CONN1.3	LCD-D1	Input	SHAFT ENCODER	HCMOS level	Data LCD
CONN1.2	LCD-D2	Input	SHAFT ENCODER	HCMOS level	Data LCD
CONN1.1	LCD-D3	Input	SHAFT ENCODER	HCMOS level	Data LCD
CONN1.10	LCD-CS	Input	SHAFT ENCODER	HCMOS level	Chip-Select LCD
CONN1.8	LCD-CP1	Input	SHAFT ENCODER	HCMOS level	Clock1 LCD
CONN1.9	LCD-CP2	Input	SHAFT ENCODER	HCMOS level	Clock2 LCD

ROHDE&SCHWARZ

Schaltteillisten numerisch geordnet

Part lists in numerical order

Listes des pièces détachées par numéros de référence

095.1000 Bl. 3

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
A31	ED RECHNER PROCESSOR BOARD NUR VAR/ONLY MOD: 02 04	1035.7250.04			
A31	ED RECHNER PROCESSOR BOARD NUR VAR/ONLY MOD: 03	1035.7766.06			
A31	ED RECHNER ABFS(FC) PROCESSOR BOARD ABFS (FC) NUR VAR/ONLY MOD: 05 13 15 16	1084.8804.10			
A34	BV E1256 DC/AC-WANDLER DC/AC-CONVERTER	0840.5698.00	ERG	0840.5698	
A35	ED DREHGEBER SYNCHRO GENERATOR	1035.5592.02			
A36	SB SCHALTFOLIE F.34TASTEN KEY PAD	1036.4354.00	HOF_KRIPPN	1036.4354	
C100	CE 22UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7533.00	BEYSCHLAG	2222 116 71229	
C101	CE 22UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7533.00	BEYSCHLAG	2222 116 71229	
H2	AF HLMP1719 LED3 GE585N LED	AF 0099.9140.00	QUALITY	HLMP-1719.L31S	1035.5486.00
P1	BP DMF50161NFUFW FSTN S/W DISPLAY WITH ILLUMINATION	0008.9094.00	OPTREX	DMF50161NFU-FW	
W10	DY KABEL W10	1035.5686.00			
W11	DF FLEX-STRIPVERB.10P FLEX-STRIP	1035.5634.00			F
W11	DF FLEX-STRIPVERB.10P. FLEX-STRIP	1036.4625.00	SUMITUMO	SMCD-10X170-ADX10-P1	1035.5634.00
X2	SB NETZSCHALTER 2XU O.KN. POWER SWITCH	SB 0007.5143.00	ITT-SEL	NE18 2U E E	1035.5486.00

MEZ1 062 3PLU	Äl	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr. Page
ROHDE&SCHWARZ	26	05.07.00	ZE FRONTMODUL	1035.5440.01 SA	1-

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C11	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C12	CE 10UF+-20%50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7427.00	PHILIPS_CO	2222 116 11109	
C13	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C50 ..53	CE 470UF+-20%25V12,5X12,5 ELECTROLYTIC CAPACITOR	0803.0715.00	NAT_PANASO	ECA-1EM471	
C54 ..58	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C59	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C60	CE 22UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7533.00	BEYSCHLAG	2222 116 71229	
C61	CE 47UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7479.00	PANASONIC	ECA-1HFG470I	
C70	CE 100UF +-20% 25V RM2.5 ELECTROLYTIC CAPACITOR	CE 0008.7891.00	PANASONIC	ECA-1EFG101I	
C71	CE 10UF+-20%50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7427.00	PHILIPS_CO	2222 116 11109	
C72	CE 10UF+-20%50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7427.00	PHILIPS_CO	2222 116 11109	
C73	CE 47UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7479.00	PANASONIC	ECA-1HFG470I	
C74	CE 47UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7479.00	PANASONIC	ECA-1HFG470I	
C75	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C76	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C77	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	AVX	1206 5 C 222 KA 3	
C79	CE 10UF +-10% 25V 7343 TANTALUM SMD-CAPACITOR	CE 0007.7246.00	SPRAGUE	293D 106 X9 025 D2W	
E1	BS UGN3120U HALL-EFF.SW. HALL-EFF.SWITCH	BJ 0336.4750.00	ALLEGRO	UGN3120U	
E2	BS UGN3120U HALL-EFF.SW. HALL-EFF.SWITCH	BJ 0336.4750.00	ALLEGRO	UGN3120U	
L10	LD 4,7UH 10%1,20HM 0,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L50	LD 100UH 20% 1A 0,6500HM CHOKE	LD 0155.9446.00	FASTRON_GE	MESC-101M-00	
L51	LD 100UH 20% 1A 0,6500HM CHOKE	LD 0155.9446.00	FASTRON_GE	MESC-101M-00	
N50	BO LM317T +ADJ1A5 VREGL VOLTAGE REGULATOR	0339.4080.00	NSC	LM-317T	
N51	BO LM2903D 2XLP COMPAR DUAL	0520.7734.00	SIGNETICS	LM2903(D)	
N70	BO LT1054CS INV SCH.REGL IC SWITCHED CAP. REGULAT	1036.4519.00	LINEAR_TEC	LT1054CSW	
R1	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R2	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R48	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R49	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R50	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	ROEDERSTEI	D25	
R53	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R54	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R55	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	DRALORIC	CR 1206	
R56	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	DRALORIC	CR 1206	
R57	RG O-OHM WIDERSTAND 1206 RESISTOR CHIP O-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R58	RG O-OHM WIDERSTAND 1206 RESISTOR CHIP O-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R59	RG 243 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6010.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R60	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R61	RG 243 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5620.00	ROEDERSTEI	D25	
R72	RL 0,60W4,75 OHM+-1%TK50 METALFILMRESISTOR	RL 0099.8021.00	PHILIPS_CO	MRS 25	
R73	RG 0-OHM WIDERSTAND 1206 RESISTOR CHIP 0-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R74	RL 0,60W4,75 OHM+-1%TK50 METALFILMRESISTOR	RL 0099.8021.00	PHILIPS_CO	MRS 25	
R75	RG 432 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6062.00	PHILIPS_CO	RC02	
R76	RG 33,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5914.00	DALE	CRCW 1206G...F-T	
R77	RG 39,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5937.00	PHILIPS_CO	RC02	
R78	RG 20,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5866.00	ROEDERSTEI	D25	
S1	EM DREHIMPULSGEBER ROTARY MAGNET	EM 0336.3348.00			
V48	AK BC337-40 N 45V 500MA TRANSISTOR	AK 0815.7684.00	PHILIPS	BC337-40 GEGURTET	
V50	AE BZV55/C5V1 0.5W ZDI ZENER DIODE	AE 0006.9839.00	PHILIPS_SE	BZV55B5V1 (GEG)	
V51	AE BZV55/C4V3 0.5W ZDI ZENER DIODE	AE 0709.0168.00	PHILIPS_SE	BZV55B4V3	
V52	AK BC337-40 N 45V 500MA TRANSISTOR	AK 0815.7684.00	PHILIPS	BC337-40 GEGURTET	
V70	AG 1N4007 GL1000V 1AO RECTIFIER	AG 0013.0310.00	ITT-SEMICO	1N4007	
V71	AG 1N4007 GL1000V 1AO RECTIFIER	AG 0013.0310.00	ITT-SEMICO	1N4007	
V72	AG 1N4007 GL1000V 1AO RECTIFIER	AG 0013.0310.00	ITT-SEMICO	1N4007	
V75	AK BC337-40 N 45V 500MA TRANSISTOR	AK 0815.7684.00	PHILIPS	BC337-40 GEGURTET	
X5	FP STIFTLEISTE 26P.2REIH. CONNECTOR 26P.	FP 0520.6544.00	BINDER	11-0213-00-26	
X6	FP BUCHSENLEISTE 4POL. ANGLE SOCKET CONNECTOR	FP 2007.5069.00	DUPONT CON	67232-004	
X7	FP LEITERPLATTENVERB.10P. CONNECTOR 10POL.	1051.4397.00	MOLEX	5597-10APB(NAPB)	
X10	FP STIFTL.WIN 3P.R2,54 ANGLE PIN CONNECTOR	FP 0009.7195.00			

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in . contained in
.	XX VARIANTENERKLAERUNG IDENTIFICATION OF MODELS				
1	STECKLOETOESE 7,5X1,1 IHL PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	
2	STECKLOETOESE 7,5X1,1 IHL PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	
B1	EO 40.000MHZ-QU.OSZ 5V QUARTZ CRYSTAL UNIT	1051.4316.00	TELEQUARZ	R&S-SACHNUMMER	
C1	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C2	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C4 ..11	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	AVX	1206 5A 100 FAT	
C12	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C13	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C14	CC 33NF+-10% 25V HDK 0603 SMD CERAMIC CAPACITOR	CC 1051.4697.00	AVX	CM105X7R333K25VAT	
C15 ..17	CE 470UF+-20%25V12,5X12,5 ELECTROLYTIC CAPACITOR	0803.0715.00	NAT_PANASO	ECA-1EM471	
C18	CC 33NF+-10% 25V HDK 0603 SMD CERAMIC CAPACITOR	CC 1051.4697.00	AVX	CM105X7R333K25VAT	
C19	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C20 ..29	CE 10UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.5605.00	PANASONIC	EEV HB 1V 100X	
C30 ..62	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C63	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C64 ..117	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C118	CE 10UF+-20%16V RUND SMD SMD ELECTROLYTIC CAPACIT.	0010.7914.00	PANASONIC	EEV-HB1C100R	
C119	CC 220NF+-10%50V X7R 1210 CERAMIC CAPACITOR CHIP	CC 0520.6850.00	AVX	1210 5C 224 KAT2A	
C120	CE 22UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.6253.00	PANASONIC	EEV HB 1V 220P	
C121	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C122 ..125	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C126 ..131	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C132	CC 33NF+-10% 25V HDK 0603 SMD CERAMIC CAPACITOR	CC 1051.4697.00	AVX	CM105X7R333K25VAT	
C133	CC 33NF+-10% 25V HDK 0603 SMD CERAMIC CAPACITOR	CC 1051.4697.00	AVX	CM105X7R333K25VAT	
C134 ..138	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C139	CC 33NF+-10% 25V HDK 0603 SMD CERAMIC CAPACITOR	CC 1051.4697.00	AVX	CM105X7R333K25VAT	
C140	CC 33NF+-10% 25V HDK 0603 SMD CERAMIC CAPACITOR	CC 1051.4697.00	AVX	CM105X7R333K25VAT	
C141	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C142	CC 33NF+-10% 25V HDK 0603 SMD CERAMIC CAPACITOR	CC 1051.4697.00	AVX	CM105X7R333K25VAT	
C143	CC 33NF+-10% 25V HDK 0603 SMD CERAMIC CAPACITOR	CC 1051.4697.00	AVX	CM105X7R333K25VAT	
C144 ..151	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C152	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	
C153 ..159	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C160 ..163	CC 47PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4644.00	MURATA	GRM39C0G***F50ZPT	
C164	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C165	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C166	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C167 ..170	CC 100PF+-1% 50VNP0 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
D1	BC E28F016SV-70 FL.MEM FLASH FILE MEMORY	BC 0010.9217.00	INTEL	E28F016SV-070 (-65)	
D2	BC E28F016SV-70 FL.MEM FLASH FILE MEMORY	BC 0010.9217.00	INTEL	E28F016SV-070 (-65)	
D3	BG TH3131 CLKGEN3 ASIC GATEARRAY	1039.1533.00	THESYS	TH3131	
D4	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
D10	BC N80960SB-16 RISC PROC RISC PROC W FLP UNIT	0008.7756.00	INTEL	N80960SB-16	
D11	BC E28F016SV-70 FL.MEM FLASH FILE MEMORY	BC 0010.9217.00	INTEL	E28F016SV-070 (-65)	
D21	BC E28F016SV-70 FL.MEM FLASH FILE MEMORY	BC 0010.9217.00	INTEL	E28F016SV-070 (-65)	
D60	BC TNT4882C IEE488-CONTRL IC IEEE488 CONTROLLER	1050.0700.00	NATIONAL/I	TNT4882C(A/B)Q	
D61	BC UPD71054L10 TIMER PROGR.INTERVAL-TIMER	1051.5258.00	NEC	(UPD)71054L-10	
D85	BC N82510 ASYNC SER CONTR ASYNC SERIAL CONTROLLER	0008.1764.10	INTEL	N82510	
D86	BC MSM82C59A-2GS INTCONTR INTERRUPT CONTROLLER	1036.4819.00	OKI	MSM82C59A-2(GS)	
D87	BG SERBUS-M2E ASIC IC GATEARRAY	1066.1976.00	FRAUNH_IFT	SERBUSM2E	
D90	BC SED1351F0A LCD-CTRL LCD CONTROLLER	0008.7727.00	SEIKO_EPSO	SED1351F0A	
D103	BL 74F30D 8INP NAND GATE IC EIGHT-INP NAND GATE	BL 0380.1482.00	SIGNETICS	N74F30D	
D106	BL 74HC132T 4XSCHMITT T QUAD 2-INP NAND SCHMITT	BL 0520.7811.00	PHILIPS_SE	(PC)74HC132(D/T)	
D199	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
D200	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
D201	BL PC74HCT173T 4XD-FF 3S QUAD D-TYPE FLIPFLOP	BL 0007.6933.00	PHILIPS	(PC)74HCT173(T)	
D202	BL 74HCT244T 8XBUFF 3S OCTAL BUFFER	BL 0007.6562.00	PHILIPS_SE	(PC)74HCT244D(T)	
D204	BL 74ACT573SC 8XTRLATCH3S IC OCTAL TRANSP.LATCH 3ST	BL 0008.0751.00	TEXAS_INST	CD74ACT573M	
D205	BL 74ACT573SC 8XTRLATCH3S IC OCTAL TRANSP.LATCH 3ST	BL 0008.0751.00	TEXAS_INST	CD74ACT573M	
D208	BL 74HCT245D 8XTRANSC OCTAL BUS TRANSCEIVER	BL 0007.5414.00	PHILIPS_SE	(PC)74HCT245(D/T)	
D209	BL 74HCT245D 8XTRANSC OCTAL BUS TRANSCEIVER	BL 0007.5414.00	PHILIPS_SE	(PC)74HCT245(D/T)	
D213	BL PC74HCT173T 4XD-FF 3S QUAD D-TYPE FLIPFLOP	BL 0007.6933.00	PHILIPS	(PC)74HCT173(T)	
D214	BL 74ACT138SC 3TO8 DECOD 3-TO-8 DECODER/DEMUX	BL 2007.5017.00	HARRIS	CD74ACT138(M)	
D216	BL 74ACT573SC 8XTRLATCH3S IC OCTAL TRANSP.LATCH 3ST	BL 0008.0751.00	TEXAS_INST	CD74ACT573M	
D299	BL 74ACT138SC 3TO8 DECOD 3-TO-8 DECODER/DEMUX	BL 2007.5017.00	HARRIS	CD74ACT138(M)	
D300	HS 1035.7308-SOFTW..D300. 1035.7308 SOFTW	1035.7550.00			1035.7543.01
D301		1035.7895.00			
D302 ..309	BC TC551001FL 128KX8 SRAM STATIC RAM 128KX8	1046.3938.00	INTEGRATED	IS62C1024L-70Q	
D310	BL 74ACT139SC 2X 1A4DEMUX IC DUAL 1-OF-4 DEMUX	BL 2000.2412.00	HARRIS	CD74ACT139M	
D400	BO LP2951CMLOWDROP +VREGL IC VOLTAGE REGULATOR	1020.0890.00	NSC	LP2951CM	
D402	HS 1035.7308-SOFTW..D402. 1035.7308 SOFTW	1035.7566.00			1035.7543.01
D500	BL 74ACT138SC 3TO8 DECOD 3-TO-8 DECODER/DEMUX	BL 2007.5017.00	HARRIS	CD74ACT138(M)	
D510	BL 74ACT138SC 3TO8 DECOD 3-TO-8 DECODER/DEMUX	BL 2007.5017.00	HARRIS	CD74ACT138(M)	
D520	BL 74ACT32SC 4X OR2 IC QUAD 2-INPUT OR GATE	BL 1012.9385.00	HARRIS	CD74ACT32M	
D540	HS 1035.7308-SOFTW..D540.	1035.7572.00			1035.7543.01

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
D550	BL 74HCT273D 8XD-FF OCTAL D-TYPE FLIPFLOP	BL 0007.6610.00	PHILIPS_SE	(PC)74HCT273(D/T)	
D560	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
D561	BL PC74HCT4075T 3X3IN ORG TRIPLE 3INPUT OR GATE	0007.6879.00	PHILIPS	(PC)74HCT4075(T)	
D562	BL PC74HCT4075T 3X3IN ORG TRIPLE 3INPUT OR GATE	0007.6879.00	PHILIPS	(PC)74HCT4075(T)	
D563	BL 74HCT74T 2XD-FLIPFL DUAL D-TYPE FLIP FLOP	BL 0007.6262.00	PHILIPS_SE	(PC)74HCT74D(T)	
D565	BL 74ACT74M 2XRSFLIPFLOP DUAL D-TYPE FLIP FLOP	BL 0008.0680.00	TEXAS_INST	(SN/CD)74ACT74D	
D566	BL PC74HC7266T4X2IN EXNOR QUAD 2INPUT EXNOR GATE	0729.4630.00	PHILIPS	(PC)74HC7266(T())	
D567	BL 74HC14T 6XINV.SCHM HEXINV.SCHMITT-TRIGGER	BL 0007.4018.00	PHILIPS_SE	(PC)74HC14(D/T)	
D568	BL 74HC14T 6XINV.SCHM HEXINV.SCHMITT-TRIGGER	BL 0007.4018.00	PHILIPS_SE	(PC)74HC14(D/T)	
D569	BL PC74HCT123T 2XMONOFLOP DUAL MULTIVIBRATOR	BL 0007.6333.00	PHILIPS_SE	(PC)74HCT123(D/T)	
D570	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
D600	BC N85C220-80 EPLD(GAL) IC PROGR LOGIC ARRAY	0008.7740.00	ALTERA	EP220LC-10A	1035.7614.00
D600	HS 1035.7308-SOFTW..D600. NUR VAR/ONLY MOD: 02	1035.7589.00			1035.7543.01
D600	HS SOFTWARE.D600 NUR VAR/ONLY MOD: 03	1035.7614.00			1035.7543.01
D621	BL 74HCT02T 4X NOR2 QUAD 2INPUT NORGATE	BL 0007.5366.00	PHILIPS_SE	(PC)74HCT02(D/T)	
D700	BS DG408DY 8CH.ANAL.MUX IC 8 CH ANALOG MULTIPLEX	1036.4460.00	SILICONIX	DG408DY	
D701	BS DG441DY 4X ANALOGSCH QUAD ANALOG SWITCH	1036.4454.00	SILICONIX	DG441DY	
D702	BL 74ACT20SC 2X4-IN NAND IC DUAL 4-INPUT NAND GATE	BL 0008.0700.00	HARRIS	CD74ACT20M	
D703	BL 74HCT273D 8XD-FF OCTAL D-TYPE FLIPFLOP	BL 0007.6610.00	PHILIPS_SE	(PC)74HCT273(D/T)	
D704	BJ AD7870KP 1X12B-ADC ANALOG DIGITAL CONVERTER	1036.4402.00	ANALOG_DEV	AD7870KP	
D706	BJ AD7245JP 1X12B-DAC DIGITAL/ANALOG CONVERTER	1036.4419.00	ANALOG_DEV	AD7245JP	
D800	HS 1035.7308-SOFTW..D800.	1035.7595.00			1035.7543.01
D810	BL 74HCT273D 8XD-FF OCTAL D-TYPE FLIPFLOP	BL 0007.6610.00	PHILIPS_SE	(PC)74HCT273(D/T)	
D820	BL 74HCT00T 4XNAND2 NAND GATE	BL 0007.6156.00	PHILIPS_SE	(PC)74HCT00D(T)	
D825	BL 74HCT00T 4XNAND2 NAND GATE	BL 0007.6156.00	PHILIPS_SE	(PC)74HCT00D(T)	
D830	BL PC74HCT20T 2X4IN.NAND NAND GATE	BL 0007.6210.00	PHILIPS_SE	74HCT20D	
D840	BL 74HCT86T 4X EXOR2 EXOR GATE	0007.6291.00	PHILIPS_SE	(PC)74HCT86(D/T)	
D860	BJ LT1181ACS RS232 2TX2RX RS-232 TRANSCEIVER	1008.2915.00	LINEAR_TEC	LT1181ACSW	
D950	HS 1035.7308-SOFTW..D950.	1035.7608.00			1035.7543.01
D960	BC 84256-12LP 32KX8 SRAM SRAM	BC 0007.6985.00	INTEGRATED	IS62C256-70U	
D970	BC 84256-12LP 32KX8 SRAM SRAM	BC 0007.6985.00	INTEGRATED	IS62C256-70U	
D980	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
G1	EO 64,000MHZ-QU.OSZ TTL5V CLOCK OSCILLATOR	1036.4431.00	PHILIPS_CO	XO 5860W(5850)	
G85	EO 18,432MHZ-QU.OSZ 5V CLOCK OSCILLATOR	0008.1770.00	TELEQUARZ	R&S-SACHNUMMER	
G300	EB 3,4V LITHIUM-BATTERIE LI BATTERY	0565.1687.00	ACCU_SONNE	SL-750/P/009 1110750	
H200	EL TONGEBER 6V 40MIA WARNING DEVICE 6V	0836.8538.00	DIGISOUND	F/SWX-06	
K1	SN RELAIS 5V 1XU MONOST. RELAY	SN 1078.3256.00	SIEMENS	V23026-D1021-B201	
L1 ..3	LD SMD-DR.Z=625 OHM 50MHZ CHOKE	1078.3240.00	PHILIPS_CO	4330 030 41663	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
N1	BO 79L05ACM-5V5%OA1VREGL VOLTAGE REGULATOR 5VDC	0851.6703.00	NSC	LM79L05ACM(X)	
N700	BO OP97FS LP PREC OPAMP LOW POWER OPAMP	1036.4390.00	PMI	OP97F(S)	
N701	BO OP97FS LP PREC OPAMP LOW POWER OPAMP	1036.4390.00	PMI	OP97F(S)	
N702	BO OP07CS8 OPAMP OPERATIONAL AMPLIFIER	0007.7781.00	LINEAR_TEC	LT1001(CS8)	
P1	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P2	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P3	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P4	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P5	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P6	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P7	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P9	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P10	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P11	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P12	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P13	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P14	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P15	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P16	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P17	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P21	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P22	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P23	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P24	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P700	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P710	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P720	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P730	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
R1 ..10	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R11	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R12 ..16	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R17	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R18	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R19	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R20 ..33	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R34	RG 10,0KOH+-0,1%TK25 1206 SMD-RESISTOR	0009.7666.00	DRALORIC	M25TK25....0.1% 1206	
R35 ..50	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R51	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R52	RG 10,2KOH+-O,1%TK25 1206 SMD-RESISTOR	0009.7614.00	PHILIPS_CO	MPC 01	
R53 ..65	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R66	RG 1,0 KO +-O,1%TK25 1206 SMD-RESISTOR	0009.7595.00	DRALORIC	M25TK25....0.1% 1206	
R67 ..86	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	DRALORIC	CR 1206	
R87	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R88	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R89	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R90 ..96	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R97	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R98	RG 5,11KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0729.00	ROEDERSTEI	D25	
R99	RG 5,11KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0729.00	ROEDERSTEI	D25	
R100	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R101	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R102	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	DRALORIC	CR 1206	
R103	RG 1,0MOHM+-1%TK100 1206 CHIP RESISTOR	RG 0815.7532.00	ROEDERSTEI	D 25	
R104 ..114	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	DRALORIC	CR 1206	
R115 ..138	RG 47K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7072.00	ROEDERSTEI	D11 0603	
R139 ..142	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	DRALORIC	CR 1206	
R143	RG 47K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7072.00	ROEDERSTEI	D11 0603	
R144	RG 47K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7072.00	ROEDERSTEI	D11 0603	
R145	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	DRALORIC	CR 1206	
R146	RG 47K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7072.00	ROEDERSTEI	D11 0603	
R147 ..162	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	DRALORIC	CR 1206	
R163 ..166	RG 47R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6924.00	DRALORIC	CR 0603	
R167	RG 10R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5328.00	YAGEO	RC0603	
R168	RG 2,0KOHM+-O,1%TK25 1206 SMD-RESISTOR	0009.7608.00	PHILIPS_CO	MPC 01	
R169 ..172	RG O-OHM WIDERSTAND 1206 RESISTOR CHIP O-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R173	RG 88,7KOH+-O,1%TK25 1206 SMD-RESISTOR	0009.7650.00	PHILIPS_CO	MPC 01	
R174	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R175	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R176	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R177	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R178 ..185	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R186 ..200	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R201	RG 27,4KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5895.00	ROEDERSTEI	D25	
R202	RG 51,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8810.00	DRALORIC	CR 1206	
R203	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R204	RG 220R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6953.00	YAGEO	RC0603	
R205 ..221	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	

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Kennz. Comp. No.	Benennung Designation		Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R222	RG 39,2KOHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5937.00	PHILIPS_CO	RC02	
R223	RG 182 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5595.00	ROEDERSTEI	D25	
R224	RG 100K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5363.00	PHILIPS_CO	RC 22 H	
R225	RG 100K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5363.00	PHILIPS_CO	RC 22 H	
R226	RG 20KOH +-0,1% TK25 SMD-RESISTOR	1206	0009.7643.00	DRALORIC	M25TK25....0.1% 1206	
R227	RG 5,62KOHM+-1%TK100 CHIP RESISTOR	1206	RG 0007.0735.00	ROEDERSTEI	D25	
R228	RG 681 OHM+-1%TK100 CHIP RESISTOR	1206	RG 0006.9080.00	ROEDERSTEI	D25	
R229	RG 12,0KOH+-0,1%TK25 SMD-RESISTOR	1206	0009.7620.00	PHILIPS_CO	MPC 01	
R230	RG 100,0KOH+-1%TK100 CHIP RESISTOR	1206	RG 0007.1948.00	ROEDERSTEI	D25	
R231	RG 10,0KOHM+-1%TK100 RG CHIP RESISTOR	1206	RG 0007.0793.00	DRALORIC	CR 1206	
R232	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R233	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R234	RG 10,0KOHM+-1%TK100 RG CHIP RESISTOR	1206	RG 0007.0793.00	DRALORIC	CR 1206	
R235 ..237	RG 47,5KOHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5950.00	DRALORIC	CR 1206	
R238	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R239	RG 1KO +-1% TK100 CHIP RESISTOR	1206	RG 0006.7271.00	DRALORIC	CR 1206	
R240 ..243	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R244 ..247	RG 4K75 +-1% TK100 RESISTOR CHIP	1206	RG 0007.5820.00	DRALORIC	CR 1206	
R248	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R249	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R250	RG 10,0KOHM+-1%TK100 RG CHIP RESISTOR	1206	RG 0007.0793.00	DRALORIC	CR 1206	
R251	RG 10,0KOHM+-1%TK100 RG CHIP RESISTOR	1206	RG 0007.0793.00	DRALORIC	CR 1206	
R252	RG 2,21KOHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5743.00	DRALORIC	CR 1206	
R253 ..273	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R274	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R275	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R276	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R277	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R278	RG 100,0KOH+-1%TK100 CHIP RESISTOR	1206	RG 0007.1948.00	ROEDERSTEI	D25	
R279 ..286	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R287	RG 10,0KOHM+-1%TK100 RG CHIP RESISTOR	1206	RG 0007.0793.00	DRALORIC	CR 1206	
R289 ..302	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R303 ..305	RG 100R +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5334.00	DRALORIC	CR 0603	
R306	RG 10,0KOHM+-1%TK100 RG CHIP RESISTOR	1206	RG 0007.0793.00	DRALORIC	CR 1206	
R401	RG 39R2 +-1% TK100 SMD RESISTOR EIA0603	0603	0010.9400.00	PHILIPS_CO	RC 22 H	
R591	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R592	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R593	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R594	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R595	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R596	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R597	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R598	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603 NICHT BESTUECKT/NOT FITTED	RG 0009.5340.00	DALE	CRCW 0603	
R600	RG O-OHM WIDERSTAND 1206 RESISTOR CHIP O-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R990	RS 0,5W 1K+-10% Q10XH5 CERMET TRIMMING POTENTIOM	2027.1446.00	DIPLOMATIC	P67 1K 10%	
R995	RS 0,5W 200K+-10% Q10XH5 POTENTIOMETER	1036.4377.00	DIPLOMATIC	P67 200K 10%	
V1 ..3	AK BC860B P 45V 150MA TRANSISTOR	AK 0007.7975.00	MOTOROLA	BC860B	
V4 ..7	AD BAS216 75V UDI HIGHSPEED SWITCHING DIODE	0010.9346.00	PHILIPS_SE	BAS216	
V8	AD BAS216 75V UDI HIGHSPEED SWITCHING DIODE	0010.9346.00	PHILIPS_SE	BAS216	
V9	AE BZV55/C5V1 0.5W ZDI ZENER DIODE	AE 0006.9839.00	PHILIPS_SE	BZV55B5V1 (GEG)	
V10	AD BAV99 75V DUO UDI HIGH-SPEED DOUBLE DIODE	AD 0911.0092.00	VALVO	BAV99	
V11	AK BC850B N 45V 100MA TRANSISTOR	AK 0007.7969.00	VALVO	BC850B	
V12	AK BC850B N 45V 100MA TRANSISTOR	AK 0007.7969.00	VALVO	BC850B	
V13 ..20	AE HSMS2800 SCHOTTKY SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V21	AE BZV55/C3V3 0,5W ZDI ZENER DIODE	0006.9800.00	PHILIPS_SE	BZV55B3V3	
V22	AD BAS216 75V UDI HIGHSPEED SWITCHING DIODE	0010.9346.00	PHILIPS_SE	BAS216	
X31	DY KABEL W31 CABLE W31	1035.7320.00			
X33	FP STECKERLEISTE 10P.GER CONNECTOR 10P	0846.4593.00	SIEMENS	V23535-A2200-A102	
X34	FP STECKERLEISTE 26P.GER CONNECTOR 26P.	FP 0820.8610.00	SIEMENS	V23535-A2200-A262	
X35	DY BUCHSENLEISTE X315 BUCHSENLEISTE X315	1035.7337.00			
X36	FP LEITERPLATTENVERB.13P CONNECTOR	0840.6436.00	DUPONT CON	68100-013	
X37	FP LEITERPLATTENVERB.13P CONNECTOR	0840.6436.00	DUPONT CON	68100-013	
X85	FP STIFTLEISTE 2P.R=2 CONNECTOR	FP 1065.8931.00	SUYIN	20010S-02G2T	
X105	FP KURZSCHLUSSBUCHSE R=2 SHORTING PLUG	FP 1043.9870.00	BERG_ELEKT	86730-001	
X300	FP STIFTLEISTE 2P.R=2 CONNECTOR	FP 1065.8931.00	SUYIN	20010S-02G2T	
X312	FP STIFTL.WIN 5P.R2,54 ANGLE PIN CONNECTOR	FP 0009.7214.00			
X501	FP STECKERLEISTE 50P.R=2 CONNECTOR	FP 6047.8835.00	BERG_ELEKT	86964-641	
X502	FP STECKERLEISTE 50P.R=2 CONNECTOR	FP 6047.8835.00	BERG_ELEKT	86964-641	
X600	FP STIFTLEISTE 2P.R=2 CONNECTOR	FP 1065.8931.00	SUYIN	20010S-02G2T	
X700	FP STIFTLEISTE 2P.R=2 CONNECTOR	FP 1065.8931.00	SUYIN	20010S-02G2T	
X800	FP STIFTLEISTE 3P.R=2 CONNECTOR	FP 4039.4360.00	SAMTEC	TMM-103-03-S-S	
X900	FP STIFTLEISTE 2P.R2,54 PIN CONNECTOR	FP 0009.5992.00			

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ROHDE&SCHWARZ

XY-Liste

XY List

Erklärung der Spaltenbezeichnungen:

el. Kennz.	**Bauelement-Kennzeichen**
Seite	**Leiterplatten-Seite, auf der sich das Bauelement befindet**
X/Y	**Koordinaten (in Millimeter) des Bauelementes auf der Leiterplatte bezogen auf den Nullpunkt**
Planq., Bl.	**Planquadrat und Seite des Schaltbildes für das jeweilige Bauelement**

Explanation of column designations:

Part	**Identification of instrument part**
Side	**Side of the PC board on which instrument part is positioned**
X/Y	**Coordinates (in units of millimeters) of the component on the PC board in reference to zero point**
Sqr, Pg	**Square and page of the diagram for the respective instrument part**

Service-Relevante Bauteile / Service-Relevant Components

Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg
E1	A	36	27	7D	1	S1	A	22	43	7D	1	X7	B	73	97	6B	1
E2	A	41	34	7C	1	X5	B	76	35	1F	1						
R71	B	25	10	5C	1	X6	B	4	95	6E	1						

Nicht-Service-Relevante Bauteile / Non-Service-Relevant Components

Part	Side	X	Y	Sqr	Pg
C11	A	60	46	1C	1
C12	B	55	41	2C	1
C13	A	59	37	2C	1
C50	B	53	51	2D	1
C51	B	58	66	2D	1
C52	B	51	81	5E	1
C53	B	39	79	6E	1
C54	A	53	54	1D	1
C55	A	59	70	2D	1
C56	A	14	85	5E	1
C57	A	42	79	6E	1
C58	A	45	96	2A	1
C59	A	17	85	5E	1
C60	B	29	97	4D	1
C61	B	27	90	4D	1
C70	B	45	23	3B	1
C71	B	62	9	3C	1
C72	B	51	21	4C	1
C73	B	51	11	4C	1
C74	B	53	29	5C	1
C75	A	49	24	3B	1
C76	A	32	10	5C	1
C77	A	39	4	4C	1
C79	A	67	45	4B	1
L10	B	58	33	2C	1
L50	B	45	68	2D	1
L51	B	36	95	6E	1
N50	B	29	76	4E	1
N51-A	A	55	95	3D	1
N51-B				4D	1
N51-C				2A	1
N70	A	37	10	3B	1
MAS	B	56	58	2D	1
R1	A	39	27	7D	1
R2	A	44	29	7C	1
R48	A	41	88	3E	1
R49	A	38	85	3E	1
R50	A	19	83	5E	1
R53	A	22	79	5E	1
R54	A	41	90	3E	1
R55	A	33	92	4E	1
R56	A	30	93	4E	1
R57	A	52	98	3D	1
R58	A	45	93	4D	1
R59	A	22	91	4D	1
R60	A	19	88	5E	1
R61	A	24	85	5E	1
R72	B	52	6	3C	1
R73	A	25	7	5C	1
R74	B	58	3	3C	1
R75	A	32	7	5C	1
R76	A	42	6	4B	1
R77	A	65	28	4B	1
R78	A	65	34	4B	1
V48	B	34	90	3E	1
V50	A	50	88	3D	1
V51	A	59	93	3D	1
V52	B	16	90	5D	1
V70	B	57	10	4C	1
V71	B	48	7	4C	1
V75	B	68	25	4B	1
X10	B	72	3	6C	1

Service–Relevante Bauteile / Service–Relevant Components

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
D300	B	226	137	1F	7
D300	B	226	137	3C	7
G300	B	277	11	4B	7
R600	B	240	133	2C	7
X31	B	173	15	1A	2
X33	B	84	78	8A	2
X34	B	105	22	8B	2

el. Kennz *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
X35	B	9	36	6C	2
X36	B	68	89	6B	2
X37	B	68	99	6A	2
X85	B	153	24	4C	13
X105	B	194	134	3D	4
X300	B	277	17	4B	7
X312	B	292	14	7E	2

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
X501	B	291	111	3A	20
X502	B	291	24	5A	20
X600	B	106	37	2D	15
X700	B	135	114	5C	16
X800	B	172	139	2D	17
X900	B	181	23	2D	2

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ROHDE & SCHWARZ

Benennung: ED RECHNER
Designation: CPU

Sprache: *Lang.:* de

Blatt: *Sh.:* 1 +

Aei: *C.I.:* 04.00

Typ: *Type:* SMP

Datum: *Date:* 98–05–20

Abteilung: *Dpt:* MENP

Name: *Name:* IM

Sachnr.: *Part No.:* **1035.7766.01 XY**

Nicht–Service–Relevante Bauteile / Non–Service–Relevant Components

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
1	B	242	11	4B	7
2	B	277	11	4B	7
B1	B	102	50	2D	15
C1	B	214	7	3B	2
C2	B	212	7	3B	2
C4	A	55	105	3B	11
C5	A	53	105	3B	11
C6	A	63	102	3B	11
C7	A	65	102	3B	11
C8	A	68	102	3B	11
C9	A	60	105	3A	11
C10	A	58	105	3B	11
C11	B	123	44	5D	14
C12	B	14	76	5B	12
C13	B	7	76	5B	12
C14	B	234	48	5A	21
C15	B	191	47	3E	2
C16	B	211	29	3E	2
C17	B	191	34	3E	2
C18	B	217	48	5C	21
C19	B	56	16	3F	15
C20	B	207	44	4E	2
C21	B	177	36	4F	2
C22	B	176	32	3F	2
C23	B	217	123	2C	4
C24	B	213	49	3B	9
C25	B	143	65	4C	14
C26	B	79	100	7C	16
C27	B	98	101	7C	16
C28	B	79	91	6C	16
C29	B	98	87	6C	16
C30	B	184	25	2E	2
C31	A	191	43	4E	2
C32	B	201	26	2E	2
C33	B	205	49	4E	2
C34	B	174	23	3F	2
C35	B	176	44	4F	2
C36	A	210	135	2D	4
C37	B	200	125	2E	4
C38	B	199	99	1F	5
C39	B	273	146	2F	5
C40	B	289	146	4F	5
C41	B	273	130	3F	5
C42	B	289	130	5F	5
C43	B	181	99	3F	5
C44	B	193	95	1F	6
C45	B	266	89	2F	6
C46	B	197	77	3F	6
C47	B	266	111	3F	6
C48	B	266	101	4F	6
C49	B	310	144	3F	7
C50	B	324	124	2F	7
C51	B	221	138	1F	7
C52	B	285	47	8A	8
C53	B	311	47	8D	8
C54	B	311	66	8C	8
C55	B	285	105	8D	8
C56	B	285	86	8C	8
C57	B	311	105	8B	8
C58	B	285	66	8B	8
C59	B	311	86	8B	8
C60	B	205	52	1A	9
C61	A	215	59	3B	9
C62	B	240	139	2F	9
C63	B	232	7	5B	2
C64	B	3	134	4F	10
C65	B	100	109	2F	10
C66	B	110	125	2F	10
C67	B	178	95	3F	10
C68	B	96	125	3F	10
C69	B	55	115	1F	11
C70	B	163	137	2F	11
C71	B	40	127	3F	11
C72	B	41	115	3F	11
C73	B	52	130	4F	11
C74	B	21	124	1F	12
C75	B	52	141	2F	12
C76	B	6	96	2F	12
C77	B	6	106	3F	12
C78	B	73	137	4F	12
C79	B	6	85	4F	12
C80	B	149	38	1F	13
C81	B	137	21	4B	13
C82	B	143	13	4C	13
C83	B	151	13	2E	13
C84	B	151	23	2E	13
C85	B	119	24	3F	13
C86	B	137	44	6B	13
C87	B	146	39	6C	13
C88	B	181	48	2A	13
C89	A	144	30	3E	13
C90	A	139	30	3F	13
C91	B	158	43	8B	13
C92	B	152	40	7B	13
C93	B	177	51	3B	13
C94	A	132	44	2F	14
C95	B	146	65	4B	14
C96	A	118	42	5B	14
C97	A	129	42	5B	14
C98	B	37	81	3F	16
C99	B	57	81	5F	16
C100	B	121	116	6A	16
C101	A	140	125	5C	16
C102	A	86	102	3F	16
C103	B	142	139	1F	17
C104	B	139	101	7A	17
C105	B	154	83	7A	17
C106	B	174	101	8A	17
C107	B	156	118	8A	17
C108	B	74	119	3F	17
C109	B	112	135	4F	17
C110	B	96	134	2F	17
C111	B	96	145	2F	17
C112	B	28	8	4F	18
C113	B	17	71	1F	18
C114	B	36	34	2F	18
C115	B	16	41	3F	18
C116	B	12	8	3F	18
C117	B	33	57	2F	18
C118	B	173	57	3B	13
C119	A	60	140	2B	12
C120	B	140	56	7B	13
C121	A	207	59	2B	9
C122	B	85	86	7A	16
C123	B	89	86	7B	16
C124	B	95	86	7B	16
C125	B	91	86	7B	16
C126	B	238	70	7C	3
C127	B	214	97	7C	3
C128	B	237	117	4C	3
C129	B	262	93	4C	3
C130	B	169	69	5F	3
C131	B	187	123	2E	4
C132	B	272	27	7A	9
C133	B	256	27	7C	9
C134	B	104	81	4F	16
C135	B	74	54	6C	15
C136	B	84	32	6C	15
C137	A	107	47	2D	15
C138	B	99	55	6C	15
C139	B	224	27	5A	21
C140	B	239	27	5C	21
C141	B	179	77	5F	6
C142	B	267	48	7A	9
C143	B	250	48	7C	9
C144	B	234	7	5C	2
C145	B	232	22	5B	2
C146	B	189	25	2B	2
C147	B	189	22	2B	2
C148	B	194	22	2B	2
C149	B	194	25	2C	2
C150	B	198	22	2C	2
C151	B	198	25	2C	2
C152	B	202	7	2C	2
C153	B	200	11	2C	2
C154	B	204	7	2D	2
C155	B	208	7	2D	2
C156	B	206	7	3A	2
C157	B	210	7	3A	2
C158	B	216	7	3B	2
C159	B	218	8	3C	2
C160	B	220	11	3C	2
C161	B	217	22	3C	2
C162	B	222	11	3C	2
C163	B	219	22	3C	2
C164	B	224	7	3D	2
C165	B	222	22	5A	2
C166	B	227	22	2A	7
C167	B	214	22	3A	2
C168	B	226	9	5A	2
C169	B	230	9	5B	2
C170	B	228	9	5B	2
D1	B	268	30	6A	9
D2	B	252	30	6C	9
D3	B	180	133	2F	4
D3	B	180	133	5B	4
D4	B	5	123	4F	10
D4	B	5	123	6C	10
D10	B	238	79	5A	3
D11	B	235	30	4A	21
D21	B	219	30	4C	21
D60	B	95	39	4B	15
D60	B	95	39	6D	15
D61	B	60	70	3C	16
D61	B	60	70	4E	16
D85	B	126	101	5B	16
D86	B	119	80	4F	16
D86	B	119	80	6C	16
D87	B	156	89	6A	17
D87	B	156	89	7A	17
D90	B	37	38	2F	18
D90	B	37	38	3A	18
D103	B	169	61	3D	3
D103	B	169	61	4F	3
D106	B	203	121	1F	4
D106	B	203	121	3B	4
D106	B	203	121	3B	4
D106	B	203	121	7A	7
D106	B	203	121	7A	7
D199	B	182	66	4D	6
D199	B	182	66	4F	6
D200	B	199	66	2F	6
D200	B	199	66	4B	6
D201	B	269	84	2F	6
D201	B	269	84	6B	6
D202	B	191	102	3E	5
D202	B	191	102	4B	5
D202	B	191	102	4C	5
D204	B	209	102	1E	5
D204	B	209	102	2A	5
D205	B	263	127	2C	5
D205	B	263	127	2E	5
D208	B	278	144	4E	5
D208	B	278	144	6B	5
D209	B	278	127	4E	5
D209	B	278	127	6C	5
D213	B	269	96	4F	6
D213	B	269	96	6C	6
D214	B	196	89	1F	6
D214	B	196	89	2B	6
D216	B	263	144	2B	5
D216	B	263	144	2E	5

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Nicht–Service–Relevante Bauteile / Non–Service–Relevant Components

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
D299	B	326	119	2F	7
D299	B	326	119	3C	7
D301	B	308	139	2F	7
D301	B	308	139	6C	7
D302	B	288	33	2A	8
D302	B	288	33	8A	8
D303	B	314	33	2C	8
D303	B	314	33	8A	8
D304	B	288	52	3A	8
D304	B	288	52	8B	8
D305	B	314	52	3C	8
D305	B	314	52	8B	8
D306	B	288	72	5A	8
D306	B	288	72	8C	8
D307	B	314	72	5C	8
D307	B	314	72	8C	8
D308	B	288	91	6A	8
D308	B	288	91	8C	8
D309	B	314	91	6C	8
D309	B	314	91	8D	8
D310	B	269	107	3F	6
D310	B	269	107	7B	6
D310	B	269	107	2C	9
D400	B	205	60	2A	9
D402	B	245	137	1E	9
D402	B	245	137	2C	9
D500	B	181	89	2A	10
D500	B	181	89	2F	10
D510	B	113	119	2B	10
D510	B	113	119	2F	10
D520	B	98	119	3C	10
D520	B	98	119	3F	10
D520	B	98	119	5A	10
D520	B	98	119	5A	10
D520	B	98	119	5B	10
D540	B	105	107	1F	10
D540	B	105	107	2D	10
D550	B	23	114	1E	12
D550	B	23	114	2C	12
D560	B	55	119	4F	11
D560	B	55	119	5C	11
D561	B	43	121	2F	11
D561	B	43	121	5D	11
D561	B	43	121	5D	11
D561	B	43	121	6D	11
D562	B	8	91	2E	12
D562	B	8	91	5C	12
D562	B	8	91	6C	12
D562	B	8	91	6C	12
D563	B	76	132	3E	12
D563	B	76	132	4A	12
D563	B	76	132	4B	12
D565	B	8	101	3E	12
D565	B	8	101	7B	12
D565	B	8	101	7B	12
D566	B	8	79	4E	12
D566	B	8	79	6B	12
D566	B	8	79	6B	12
D566	B	8	79	6C	12
D566	B	8	79	6C	12
D567	B	58	110	1F	11
D567	B	58	110	4B	11
D567	B	58	110	4C	11
D567	B	58	110	4C	11
D567	B	58	110	4C	11
D567	B	58	110	4C	11
D567	B	58	110	4C	11
D568	B	44	110	3F	11
D568	B	44	110	4D	11
D568	B	44	110	7B	11
D568	B	44	110	7B	11
D568	B	44	110	7B	11
D568	B	44	110	7B	11
D568	B	44	110	8B	11

el. Kennz *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
D569	B	55	137	1E	12
D569	B	55	137	2A	12
D569	B	55	137	2B	12
D570	B	165	126	2F	11
D570	B	165	126	5B	11
D600	B	40	71	2B	16
D600	B	40	71	2F	16
D621	B	59	10	2B	15
D621	B	59	10	2F	15
D621	B	59	10	3E	15
D621	B	59	10	3F	15
D621	B	59	10	4E	15
D700	B	150	15	2F	13
D700	B	150	15	3B	13
D701	B	138	27	3F	13
D701	B	138	27	5B	13
D701	B	138	27	5C	13
D701	B	138	27	5C	13
D701	B	138	27	5D	13
D702	B	121	18	2F	13
D702	B	121	18	3D	13
D702	B	121	18	3B	14
D703	B	151	28	1F	13
D703	B	151	28	2C	13
D704	B	160	54	6B	13
D706	B	132	56	2E	14
D706	B	132	56	3C	14
D800	B	148	138	1F	17
D800	B	148	138	2A	17
D810	B	77	109	2C	17
D810	B	77	109	3F	17
D820	B	114	129	3D	17
D820	B	114	129	3D	17
D820	B	114	129	3D	17
D820	B	114	129	3D	17
D820	B	114	129	3F	17
D825	B	98	140	2F	17
D825	B	98	140	3B	17
D825	B	98	140	3B	17
D825	B	98	140	4B	17
D825	B	98	140	4C	17
D830	B	114	140	4A	17
D830	B	114	140	4D	17
D830	B	114	140	4F	17
D840	B	98	129	1F	17
D840	B	98	129	3B	17
D840	B	98	129	3C	17
D840	B	98	129	4E	17
D840	B	98	129	4F	17
D860	B	84	90	3F	16
D860	B	84	90	6B	16
D860	B	84	90	6B	16
D860	B	84	90	7A	16
D860	B	84	90	7B	16
D860	B	84	90	7C	16
D950	B	22	71	1F	18
D950	B	22	71	2A	18
D960	B	24	10	3F	18
D960	B	24	10	7A	18
D970	B	40	10	4F	18
D970	B	40	10	7B	18
D980	B	26	44	2F	18
D980	B	26	44	6C	18
G1	B	215	139	2D	4
G85	B	141	128	5C	16
H200	B	328	135	8B	6
K1	B	281	20	3B	7
K1	B	281	20	5A	7
L1	B	184	32	3D	2
L2	B	203	38	3E	2
L3	B	170	28	3F	2
N1	B	180	51	2A	13
N700	B	140	39	6C	13
N701	B	140	15	4B	13

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
N702	B	126	38	5B	14
N702	B	126	38	5C	14
P1	B	240	22	3A	7
P2	B	179	123	5B	4
P3	B	182	123	5B	4
P4	B	184	123	5B	4
P5	B	194	129	5B	4
P6	B	194	137	4B	4
P7	B	182	142	6B	4
P9	B	146	118	6A	17
P10	B	148	118	6A	17
P11	B	159	119	7A	17
P12	B	151	118	7D	17
P13	B	162	119	6D	17
P14	B	135	96	7C	17
P15	B	138	93	7C	17
P16	B	138	112	7C	17
P17	B	137	106	7C	17
P21	B	191	55	4D	2
P22	B	201	24	4E	2
P23	B	208	50	4E	2
P24	B	178	44	4F	2
P700	B	129	45	5C	14
P710	B	146	16	4B	13
P720	B	170	49	3A	13
P730	B	149	43	6C	13
R1	B	171	72	3D	3
R2	B	183	62	3D	3
R3	B	183	59	2D	3
R4	B	177	72	2D	3
R5	B	174	72	2D	3
R6	A	186	104	4D	5
R7	A	278	80	5B	6
R8	A	278	77	5B	6
R9	A	280	89	5B	6
R10	A	275	109	7B	6
R11	B	218	52	3C	21
R12	A	237	18	2B	7
R13	A	221	135	2D	7
R14	A	337	131	2C	7
R15	A	248	137	2D	9
R16	A	251	140	2C	9
R17	B	234	51	3A	21
R18	B	231	61	5C	21
R19	B	229	61	5C	21
R20	B	101	105	2D	10
R21	B	77	125	3A	12
R22	B	80	125	3A	12
R23	B	81	140	3B	12
R24	B	78	140	3B	12
R25	A	13	83	6C	12
R26	A	18	95	5D	12
R27	A	5	98	7A	12
R28	A	18	98	7A	12
R29	B	67	139	2B	12
R30	B	49	136	2B	12
R31	B	70	139	2A	12
R32	B	119	27	3C	13
R33	B	141	36	5C	13
R34	B	137	35	5B	13
R35	B	123	12	2B	14
R36	B	125	12	2B	14
R37	B	128	12	2B	14
R38	A	128	107	6A	16
R39	A	47	64	2A	16
R40	A	74	70	2D	16
R41	A	70	80	2D	16
R42	A	67	80	3D	16
R43	B	143	135	2B	17
R44	A	119	142	4A	17
R45	A	154	95	5C	17
R46	A	146	95	7B	17
R47	A	160	104	6A	17
R48	B	44	29	3A	18

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Nicht–Service–Relevante Bauteile / Non–Service–Relevant Components

el. Kennz. / Part	Seite / Side	X	Y	Planq. / Sqr	Bl. / Pg
R49	A	18	69	2B	18
R50	A	27	71	2B	18
R51	A	237	3	2A	7
R52	A	212	55	3B	9
R53	B	68	102	2B	11
R54	B	65	102	2C	11
R55	B	63	102	2C	11
R56	B	60	102	2C	11
R57	B	58	102	2C	11
R58	B	55	102	2C	11
R59	B	53	102	2D	11
R60	B	9	74	5B	12
R61	B	12	74	5B	12
R62	B	83	87	7A	16
R63	B	87	87	7B	16
R64	B	91	104	7B	16
R65	B	93	87	7B	16
R66	B	135	24	5C	13
R67	B	214	64	4B	6
R68	B	217	64	4B	6
R69	B	219	64	4B	6
R70	B	222	64	3B	6
R71	A	326	131	3B	7
R72	A	329	131	3B	7
R73	A	229	145	3C	7
R74	A	232	145	3C	7
R75	A	234	145	4C	7
R76	A	20	131	6B	10
R77	A	18	131	5B	10
R78	A	15	131	5B	10
R79	A	13	131	5B	10
R80	A	10	131	5B	10
R81	A	8	131	5B	10
R82	A	5	131	4B	10
R83	A	3	131	4B	10
R84	B	128	119	6A	16
R85	A	100	136	3B	17
R86	A	104	136	3B	17
R87	B	17	58	6D	18
R88	B	211	118	2B	4
R89	B	195	57	1B	9
R90	A	58	96	2B	11
R91	A	55	96	2B	11
R92	A	53	96	2B	11
R93	A	60	96	2A	11
R94	A	63	92	2B	11
R95	A	65	92	2B	11
R96	A	68	92	2B	11
R97	B	44	107	7B	11
R98	A	323	140	8B	6
R99	A	334	142	8A	6
R100	B	214	9	3B	2
R101	B	212	9	3B	2
R102	B	141	60	4C	14
R103	A	149	15	3C	13
R104	A	233	75	6D	19
R105	A	231	75	7D	19
R106	A	228	75	7D	19
R107	B	227	117	7D	19
R108	B	225	117	7D	19
R109	B	212	86	3D	19
R110	B	212	93	3C	19
R111	B	212	91	3D	19
R112	B	212	88	3D	19
R113	A	223	71	3C	19
R114	A	225	71	3C	19
R115	B	294	144	4D	19
R116	B	294	142	4D	19
R117	B	294	140	4D	19
R118	B	294	138	4D	19
R119	B	294	137	4C	19
R120	B	294	131	4C	19
R121	B	294	133	4C	19
R122	B	294	135	4C	19
R123	B	294	125	4B	19
R124	B	294	127	4B	19
R125	B	294	129	4B	19
R126	B	294	119	4A	19
R127	B	294	121	4B	19
R128	B	294	123	4B	19
R129	B	294	117	4A	19
R130	B	294	116	4A	19
R131	B	263	88	2D	19
R132	B	263	90	2D	19
R133	B	263	95	2D	19
R134	B	263	97	2D	19
R135	B	263	99	2C	19
R136	B	263	101	2C	19
R137	B	263	103	2C	19
R138	B	263	105	2C	19
R139	B	262	110	2B	19
R140	A	251	121	2B	19
R141	A	248	121	2B	19
R142	A	246	121	2B	19
R143	B	245	119	2B	19
R144	B	243	119	2A	19
R145	A	239	121	2A	19
R146	B	241	119	2A	19
R147	A	236	75	6D	19
R148	A	239	75	6D	19
R149	A	241	75	6D	19
R150	A	244	75	6C	19
R151	A	246	75	6C	19
R152	A	254	75	6C	19
R153	A	251	75	6C	19
R154	A	249	75	6C	19
R155	A	258	81	6B	19
R156	A	258	79	6B	19
R157	A	258	76	6B	19
R158	B	235	117	6A	19
R159	A	258	86	6B	19
R160	A	258	84	6B	19
R161	B	232	117	6A	19
R162	B	230	117	6A	19
R163	B	139	110	7C	17
R164	B	139	95	7C	17
R165	B	139	104	7C	17
R166	B	139	98	7C	17
R167	B	213	127	2B	4
R168	B	140	24	5C	13
R169	A	220	44	3B	9
R170	A	135	40	1E	14
R171	A	118	31	5A	14
R172	A	129	35	5B	14
R173	A	210	59	3B	9
R174	A	222	131	2B	4
R175	A	196	125	6A	7
R176	B	199	127	3B	4
R177	B	216	22	3A	2
R178	B	228	61	5C	21
R179	B	226	61	6C	21
R180	B	225	61	6C	21
R181	B	223	61	6C	21
R182	B	221	61	6C	21
R183	B	220	61	6C	21
R184	B	248	54	5B	21
R185	B	246	54	5B	21
R186	B	163	18	2C	13
R187	B	159	24	2C	13
R188	B	163	16	2C	13
R189	B	230	7	2C	13
R190	B	228	7	2B	13
R191	B	226	7	2B	13
R192	B	154	13	3C	13
R193	B	147	18	3C	13
R194	B	157	23	3C	13
R195	B	151	84	6C	17
R196	B	149	84	6C	17
R197	B	147	84	6C	17
R198	B	145	84	5C	17
R199	B	139	108	8B	17
R200	B	109	132	4F	17
R201	A	193	121	6A	7
R202	A	340	139	8A	6
R203	B	282	23	3B	7
R204	B	228	22	2A	7
R205	A	64	85	7B	2
R206	A	206	102	2D	5
R207	A	200	92	2A	6
R208	A	306	142	7D	7
R209	A	208	47	3A	9
R210	A	120	122	2C	10
R211	A	12	41	5B	12
R212	A	12	53	5B	12
R213	A	143	18	4B	13
R214	A	154	50	6B	13
R215	A	170	53	3A	13
R216	B	129	42	5C	14
R217	B	126	36	5C	14
R218	B	163	139	2B	17
R219	A	23	54	6D	18
R220	A	20	47	6D	18
R221	B	26	41	5D	18
R222	A	285	10	3B	7
R223	B	123	36	6C	14
R224	B	207	119	6B	7
R225	B	209	119	7B	7
R226	A	143	41	6B	13
R227	B	208	57	2A	9
R228	A	145	106	7B	17
R229	B	145	24	5C	13
R230	B	49	144	2B	12
R231	A	218	44	3B	9
R232	B	252	54	5C	9
R233	B	268	51	5A	9
R234	A	111	96	6C	16
R235	A	228	94	5C	3
R236	A	331	131	4B	7
R237	A	334	131	4B	7
R238	B	187	121	5B	4
R239	A	232	86	7C	3
R240	B	269	26	5A	9
R241	B	252	26	5C	9
R242	B	265	60	4C	9
R243	B	284	53	4A	9
R244	A	232	97	3B	3
R245	A	232	104	3B	3
R246	A	228	102	3C	3
R247	A	228	99	3C	3
R248	B	232	9	5B	2
R249	B	244	54	5B	21
R250	A	302	145	6C	7
R251	A	88	56	3B	15
R252	A	285	4	7E	2
R253	B	264	61	7C	9
R254	B	262	61	7C	9
R255	B	261	61	7C	9
R256	B	259	61	7C	9
R257	B	258	61	8C	9
R258	B	256	61	8C	9
R259	B	255	61	8C	9
R260	B	253	61	8C	9
R261	B	282	54	7B	9
R262	B	280	54	7B	9
R263	B	278	54	7B	9
R264	B	277	54	7B	9
R265	B	275	54	8B	9
R266	B	273	54	8B	9
R267	B	271	54	8B	9
R268	B	269	54	8B	9
R269	B	243	54	6B	21
R270	B	241	54	6B	21

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Nicht–Service–Relevante Bauteile / Non–Service–Relevant Components

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
R271	B	239	54	6B	21
R272	B	237	54	6B	21
R273	B	235	54	6B	21
R274	B	236	25	4A	21
R275	B	219	26	4C	21
R276	B	232	60	3C	21
R277	B	250	53	3A	21
R278	A	288	49	5B	21
R279	B	186	59	3C	6
R280	B	188	59	3C	6
R281	B	190	59	3C	6
R282	B	191	59	3C	6
R283	B	193	59	4C	6
R284	B	196	60	4C	6
R285	B	195	59	4C	6
R286	B	185	59	3C	6
R287	B	65	18	3F	15
R289	B	234	9	5B	2
R290	B	230	22	5B	2
R291	B	189	23	2B	2
R292	B	189	27	2B	2
R293	B	194	23	2B	2
R294	B	194	27	2B	2

el. Kennz *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
R295	B	198	23	2C	2
R296	B	198	27	2C	2
R297	B	202	9	2C	2
R298	B	204	9	2D	2
R299	B	208	9	2D	2
R300	B	206	9	3A	2
R301	B	210	9	3A	2
R302	B	216	9	3B	2
R303	B	218	9	3C	2
R304	B	224	22	5A	2
R305	B	224	9	3D	2
R306	A	159	133	2B	17
R401	A	191	135	6C	4
R591	B	3	119	4C	10
R592	B	5	119	4C	10
R593	B	7	119	5C	10
R594	B	9	119	5C	10
R595	B	12	119	5C	10
R596	B	14	119	5C	10
R597	B	16	119	5C	10
R598	B	18	119	6C	10
R990	A	166	5	5E	2
R995	A	182	5	5D	2

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
V1	A	332	140	8B	6
V2	A	240	3	2A	7
V3	A	198	124	6A	7
V4	B	213	124	2B	4
V5	A	219	130	2B	4
V6	A	283	17	4A	7
V7	A	240	18	3A	7
V8	A	205	47	3A	9
V9	B	238	22	3A	7
V10	A	122	36	5C	14
V11	A	238	8	2B	7
V12	B	199	55	1B	9
V13	A	234	23	2A	7
V14	B	273	22	3B	7
V15	A	47	103	3C	12
V16	A	44	103	3C	12
V17	A	40	103	3C	12
V18	A	36	103	3C	12
V19	A	32	103	3D	12
V20	A	28	103	3D	12
V21	B	195	119	6B	7
V22	A	286	7	7E	2

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ROHDE & SCHWARZ	Benennung: *Designation:* ED RECHNER CPU		Sprache: *Lang.:* de	Blatt: *Sh.:* 5 –	Aei: *C.I.:* 04.00
Typ: *Type:* SMP	Datum: *Date:* 98–05–20	Abteilung: *Dpt:* MENP	Name: *Name:* IM	Sachnr.: *Part No.:* **1035.7766.01 XY**	

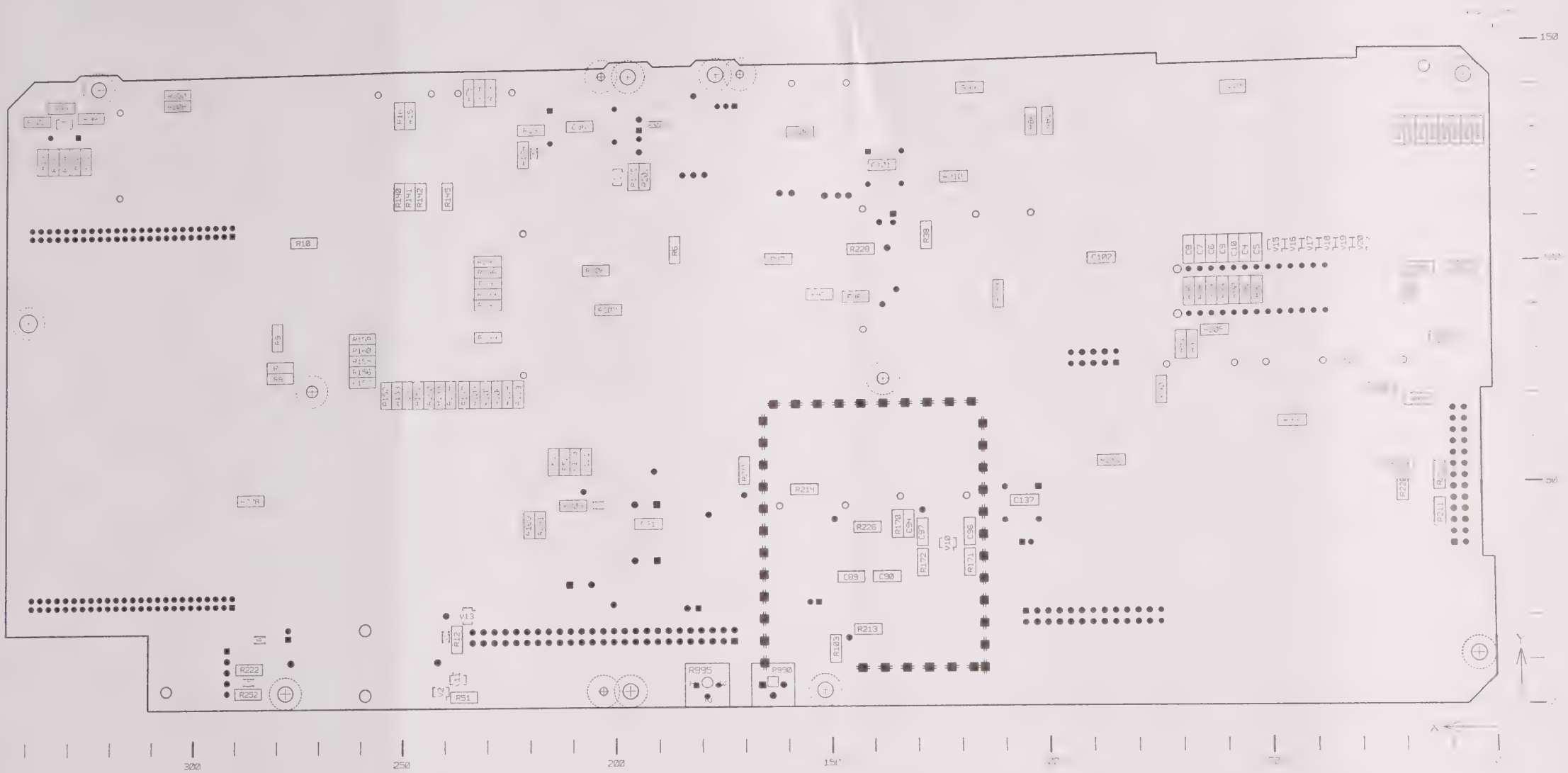
ROHDE&SCHWARZ

Stromläufe
Bestückungspläne

Circuit diagrams
Component plans

Schémas de circuit
Plans des composants

095.1000 Bl. 4



DARSTELLUNG SEITE A
VIEW ON SIDE A

ACHTUNG: EGBI
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE (MOS) IN DIESER BAUGRUPPE. BESONDERE HANDHABUNG.
ATTENTION: ESD

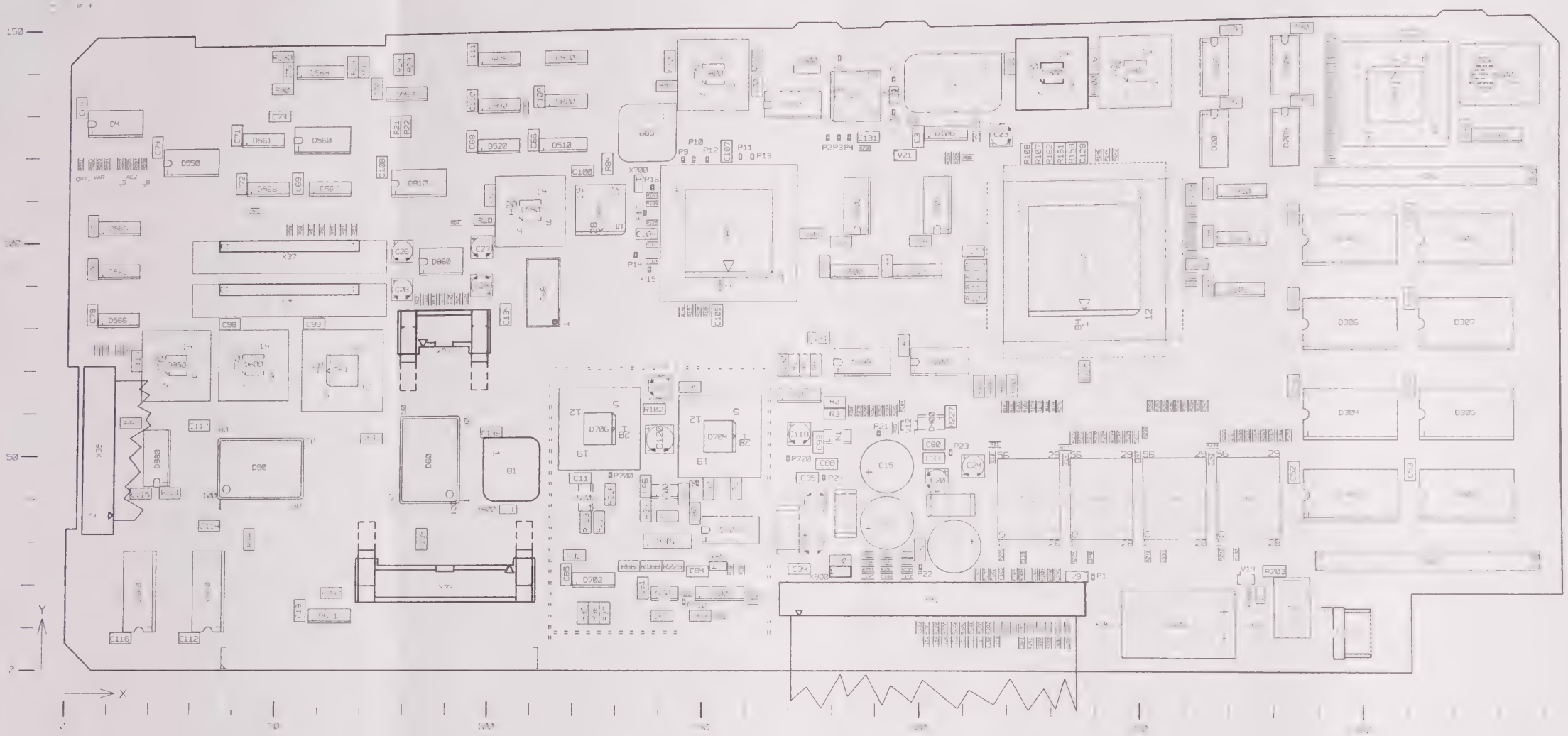
BINDENDE ANGABEN UEBER VARIANTEN, TRIMMWERTE, BAUTEILWERTE UND NICHT BESTUECKTE BAUTEILE SIEHE SA.

DN.00		MENP	DATUM	NAME
		BEARB.		IM
		GEPR.		IM
		NORM		

ROHDE&SCHWARZ

BENENNUNG
RECHNER
CPU

1035.7766.01 D



DARSTELLUNG SEITE B
VIEW ON SIDE B

ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE BAUELEMENTE ERFORDERN BESONDERE HANDHABUNG
ATTENTION ESD

TRIMMWERTE, BAUTEILWERTE

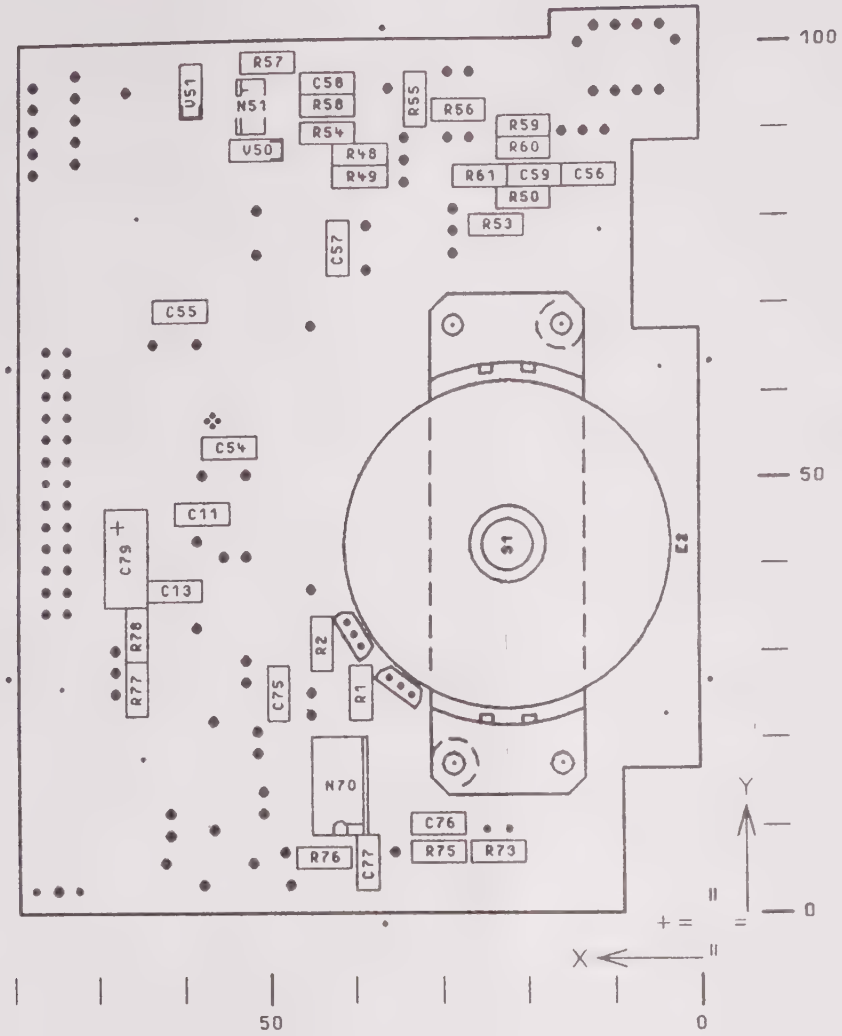
	MENP	DATUM

ROHDE&SCHWARZ

RECHNER
CPU

1035.7766.01 D

1035.5440



DARSTELLUNG SEITE A
VIEW ON SIDE A

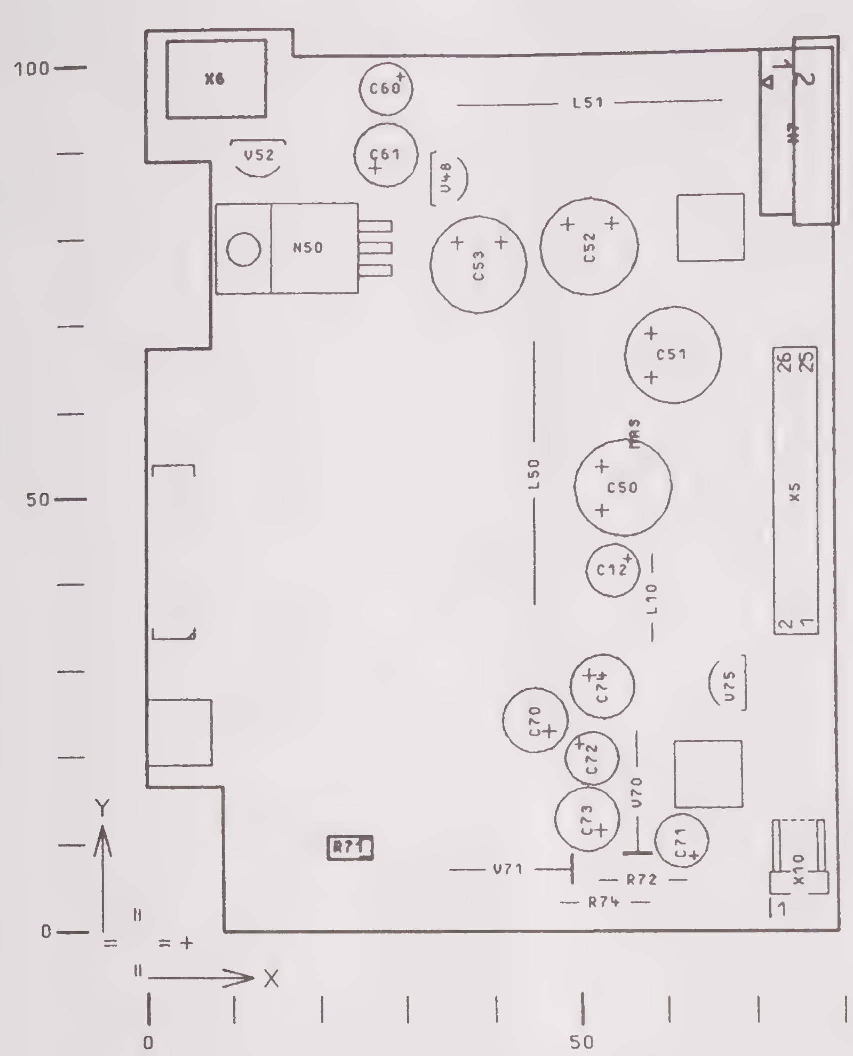
ACHTUNG: EGB!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG.
ATTENTION ESD!
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING

BINDENDE ANGABEN UEBER VARIANTEN, TRIMMWERTE, BAUTEILWERTE UND NICHT BESTUECKTE BAUTEILE SIEHE SA.

FOR BINDING INFORMATION ON MODELS, TRIMMING AND COMPONENTS VALUES AND NONFITTED COMPONENTS SEE PARTS LIST.

DW/	48730 90	07.04.94	JN	1GPK	TAG	NAME	BENENNUNG
				BEARB.		JN	DREHGEBER
				GEPR.		DR	KNOB ASSEMBLY
				NORM			Z
				PLOTT	07.04.94		
/				ROHDE&SCHWARZ			ZEICHN.-NR. 1035.5592.01 ED
AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ZU GERAET SMP			BLATT-NR. 2+
							REG.I.U. 1035.5005 ERSTE Z. 1035.5440

DIESE ZEICHNUNG IST UER DIESE ZEICHNUNG BEHALTEN WIR UNS ALLE RECHTE DES DATENSATZES ERFOLGEN RECHNERAUSDUCK, AENDERUNGEN KOENNEN NUR DURCH AEND



DARSTELLUNG SEITE B
VIEW ON SIDE B

ACHTUNG: EGB!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG.
ATTENTION ESD!
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING

BINDENDE ANGABEN UEBER VARIANTEN, TRIMMWERTE, BAUTEILWERTE UND NICHT BESTUECKTE BAUTEILE SIEHE SA

FOR BINDING INFORMATION ON MODELS, TRIMMING AND COMPONENTS VALUES AND NONFITTED COMPONENTS SEE PARTS LIST.

AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME
06/	48730 90	07.04.94	JN
/			

1GPK	TAG	NAME
BEARB.		JN
GEPR.		DR
NORM		
PLOTT	07.04.94	

ROHDE&SCHWARZ

ZU GERAET: SMP

BENENNUNG: DREHGEBER
KNOB ASSEMBLY

Z

ZEICHN.-NR. 1035.5592.01 ED

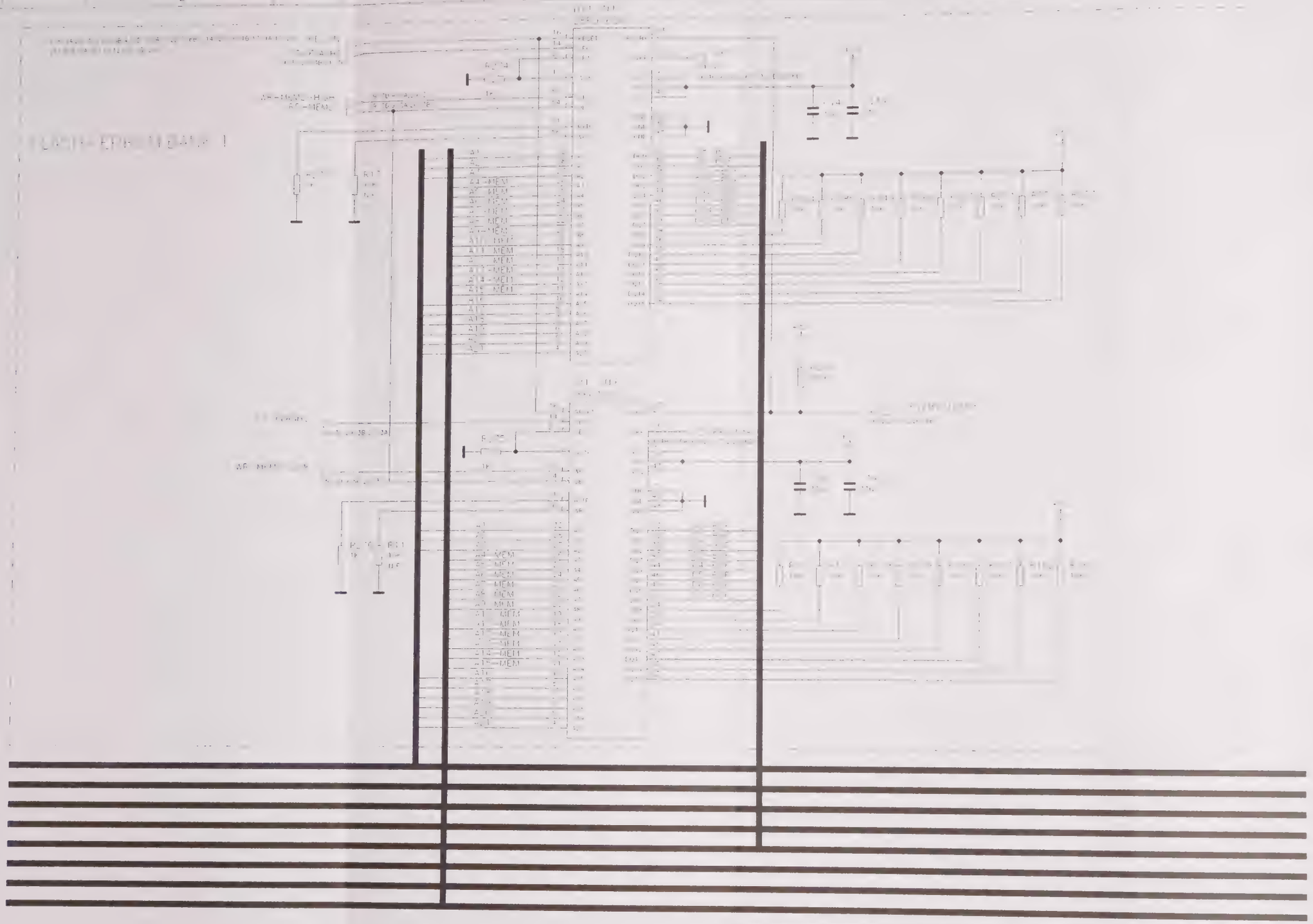
BLATT-NR. 1+

V. BL.

REG.I.V. 1035.5005

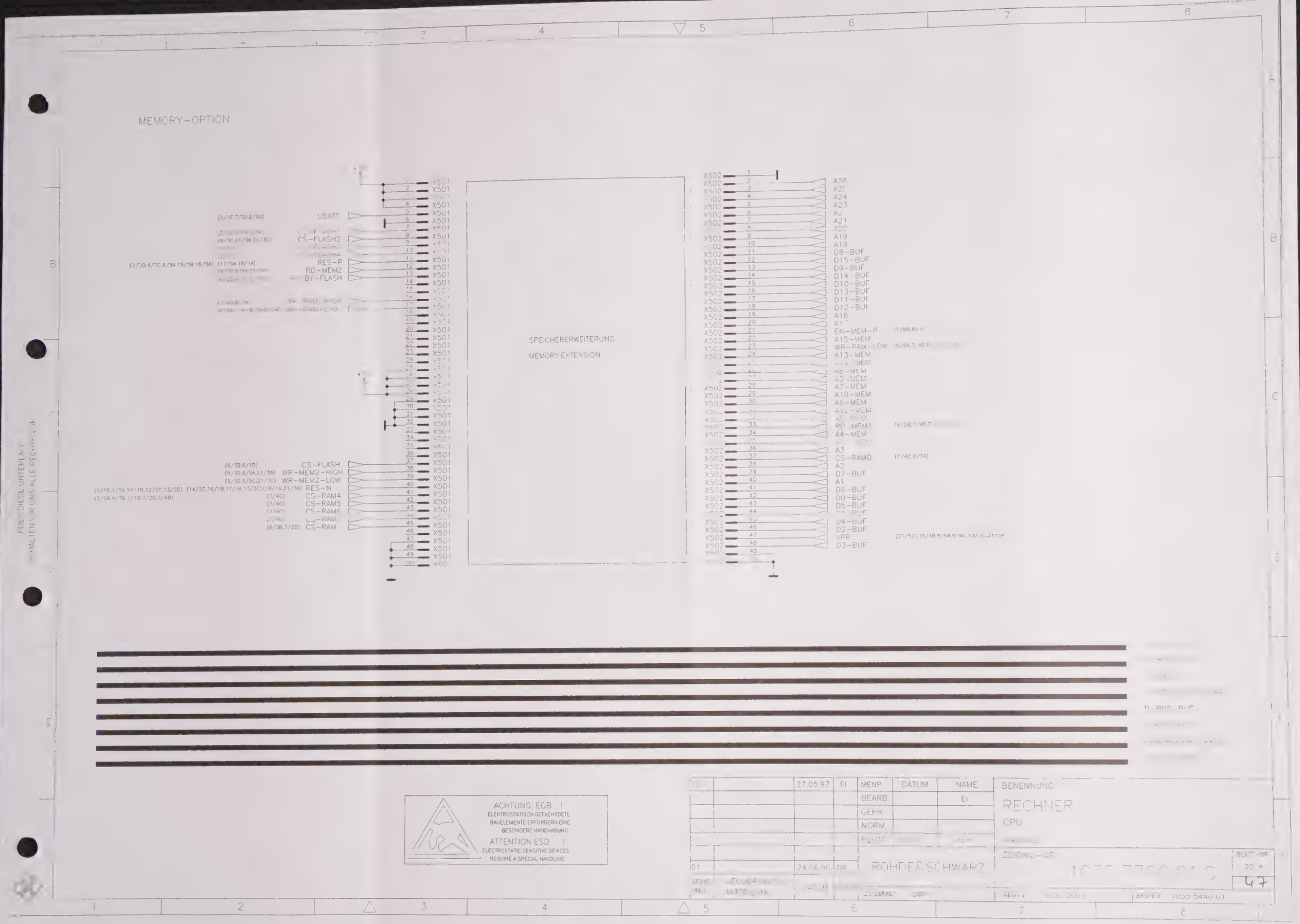
ERSTE Z. 1035.5440

DIESE ZEICHNUNG IST ... UER DIESE ZEICHNUNG BEHALTEN WIR UNS ALLE RECHTE ... RECHNERAUSDUCK, AENDERUNGEN KOENNEN NUR DURCH AEND... DES DATENSATZES ERFOLGEN

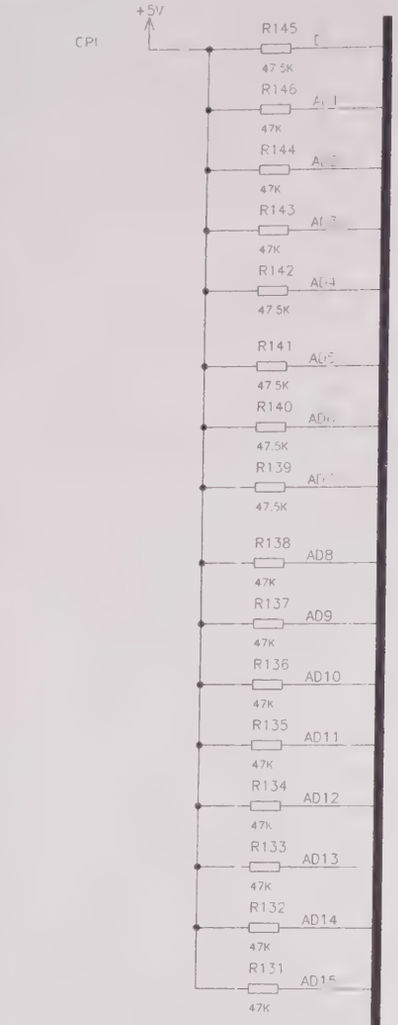


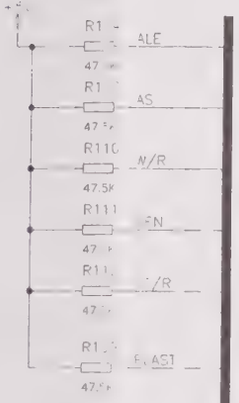
Bindende Angaben ueber Varianten.

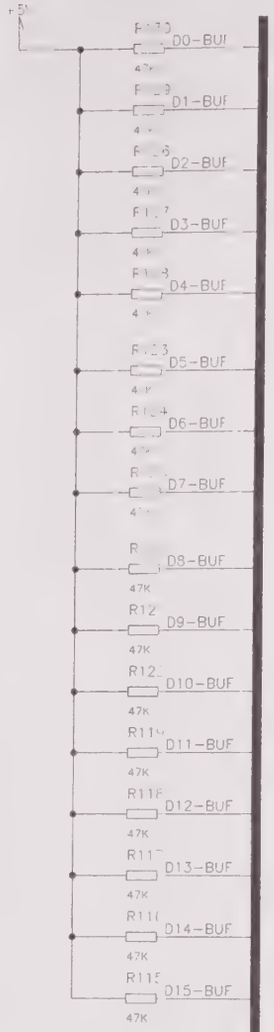
Bindende Angaben ueber Varianten

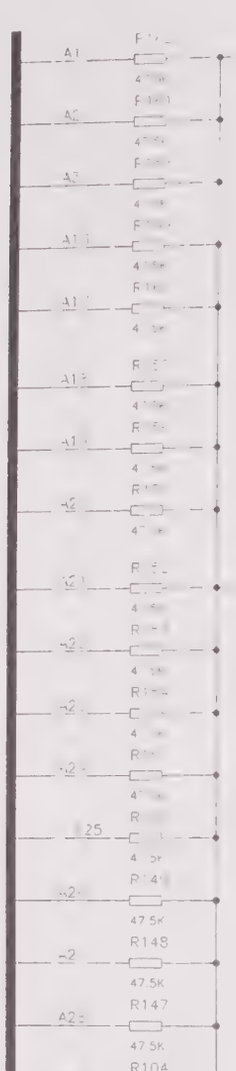

MEMORY-OPTION
SPEICHERERWEITERUNG
MEMORY EXTENSION
UBATT
CS-FLASH2
RES-P
RD-MEM2
BY-FLASH
CS-FLASH
WR-MEM2-HIGH
WR-MEM2-LOW
RES-N
CS-RAM4
CS-RAM5
CS-RAM6
CS-RAM
A26
A25
A24
A23
A21
A19
A18
D8-BUF
D15-BUF
D9-BUF
D14-BUF
D10-BUF
D13-BUF
D11-BUF
D12-BUF
A16
EN-MEM-P
A15-MEM
WR-RAM-LOW
A13-MEM
A10-MEM
A6-MEM
A4-MEM
A3
CS-RAM0
A2
D7-BUF
A1
D6-BUF
D0-BUF
D5-BUF
D4-BUF
D2-BUF
VPP
D3-BUF
ACHTUNG: EGB !
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG
ATTENTION ESD !
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING
27.05.97
EI
MENP
DATUM
NAME
BEARB.
GEPR.
NORM
BENENNUNG
RECHNER
CPU
24.06.96
DR
ROHDE&SCHWARZ
ZEICHN.-NR.
BLATT-NR
20 +
47
ERSTE Z
1035 5440 01

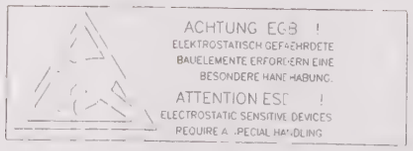
BUS & PULLUP & PULLDOWN



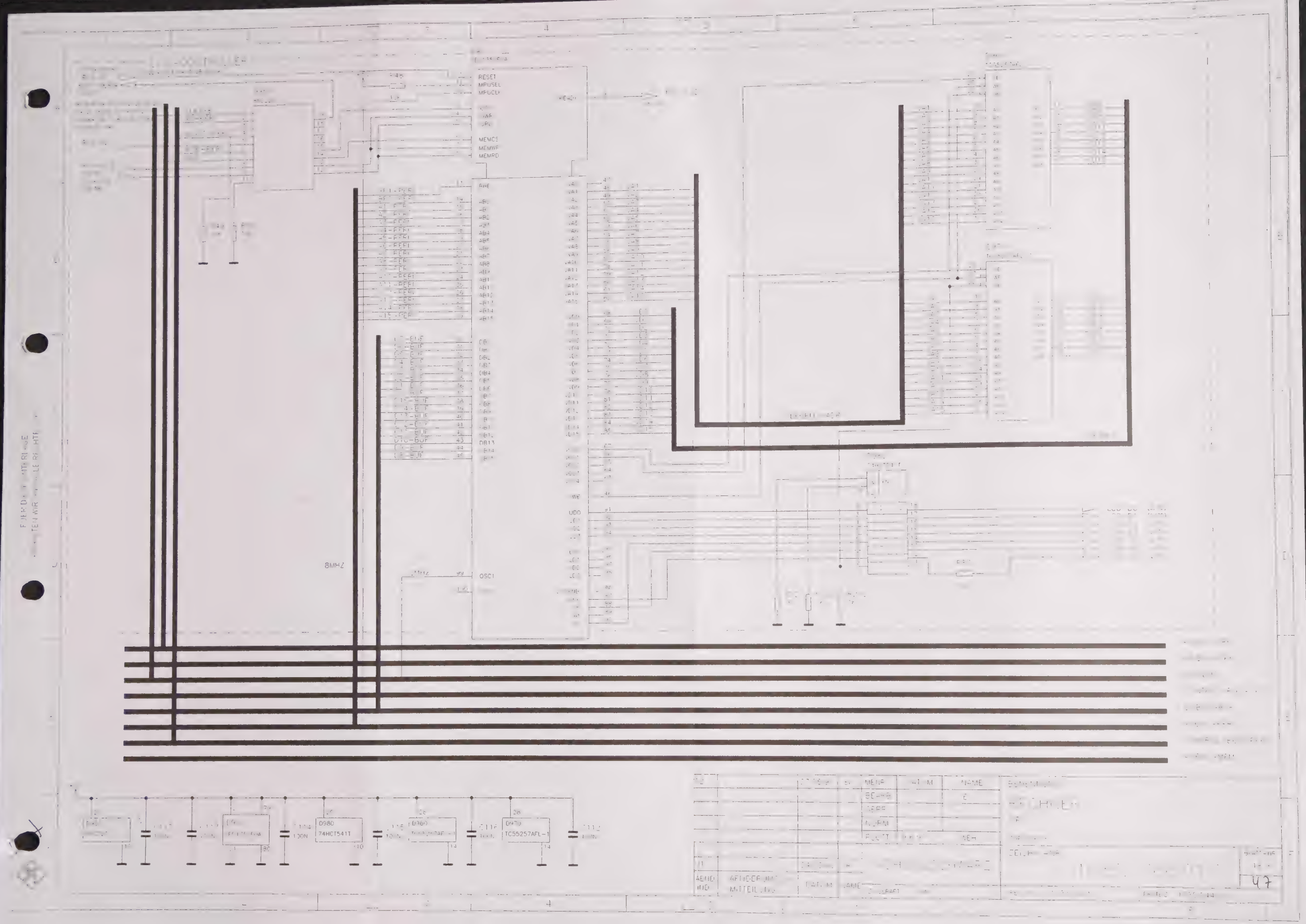


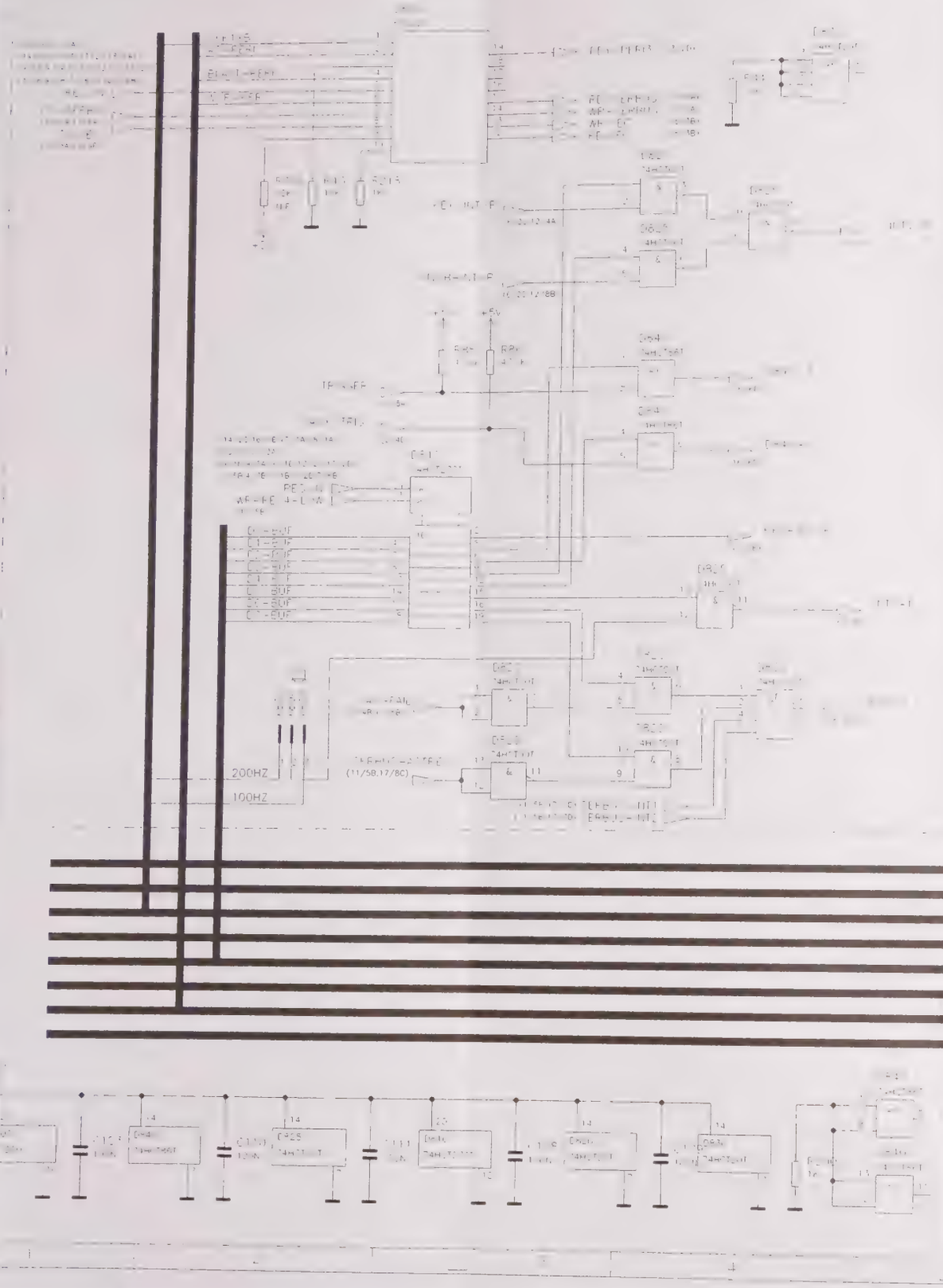


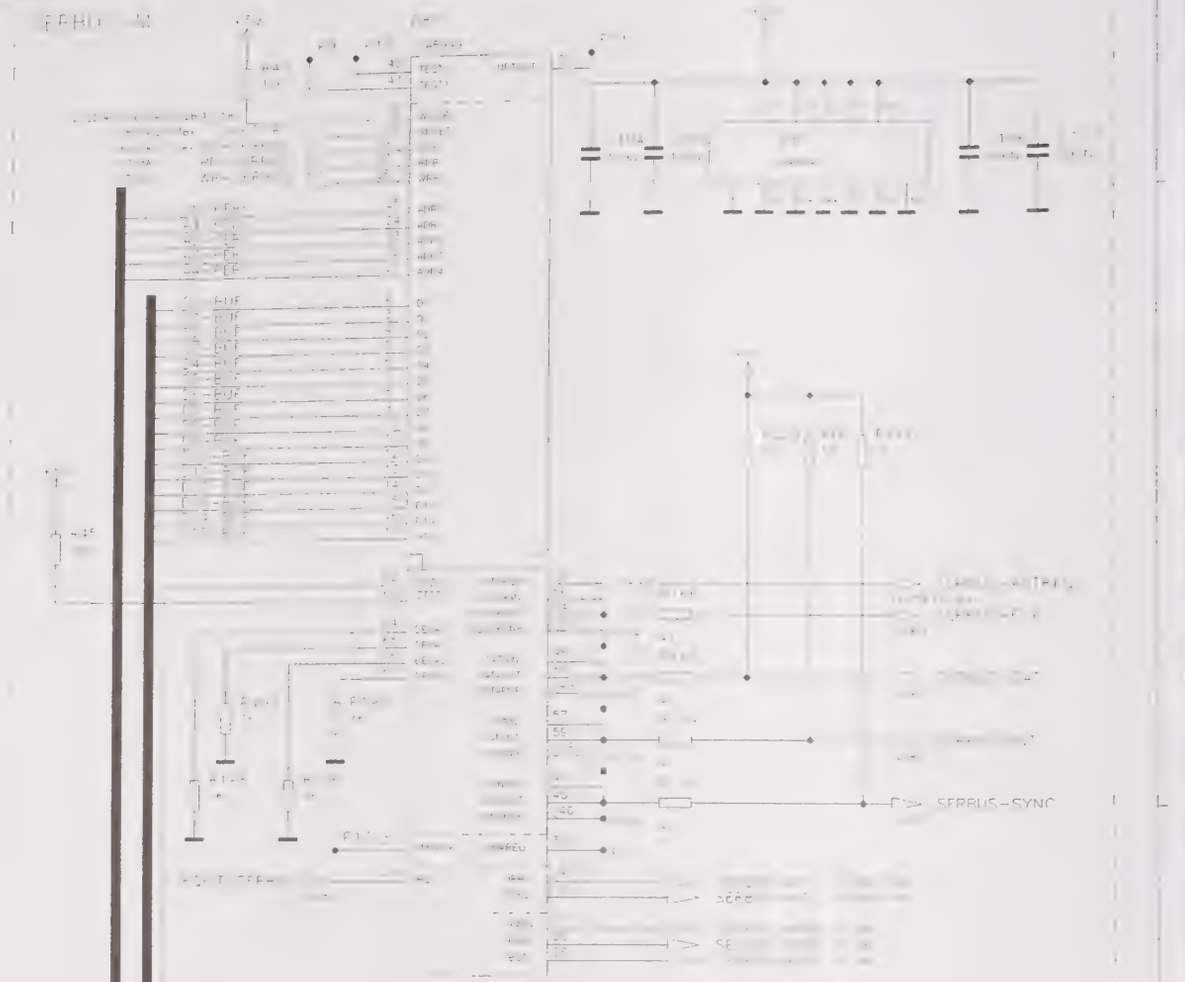


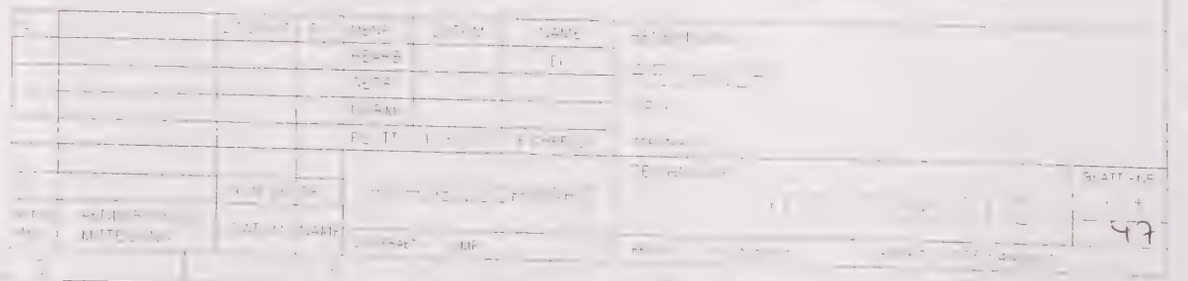


FUER DIESE UNTERLAGEN BEHALTEN WIR UNS ALLE RECHTE VOR

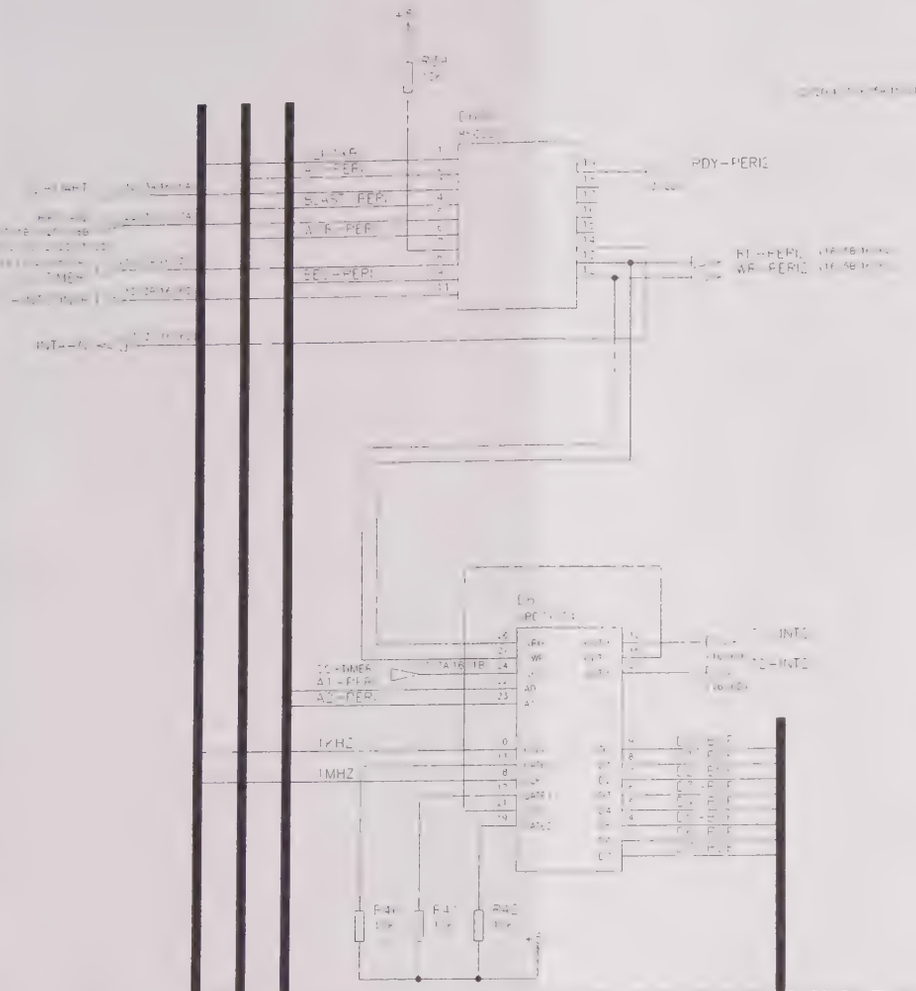

RESET
MPUSEL
MPUCLK
MEMCS
MEMWR
MEMRD
BHE
DB13
OSC1
8MHZ
UDO
D980
74HCT541T
TC55257AFL-1
100N
NAME
AEND
IND
47

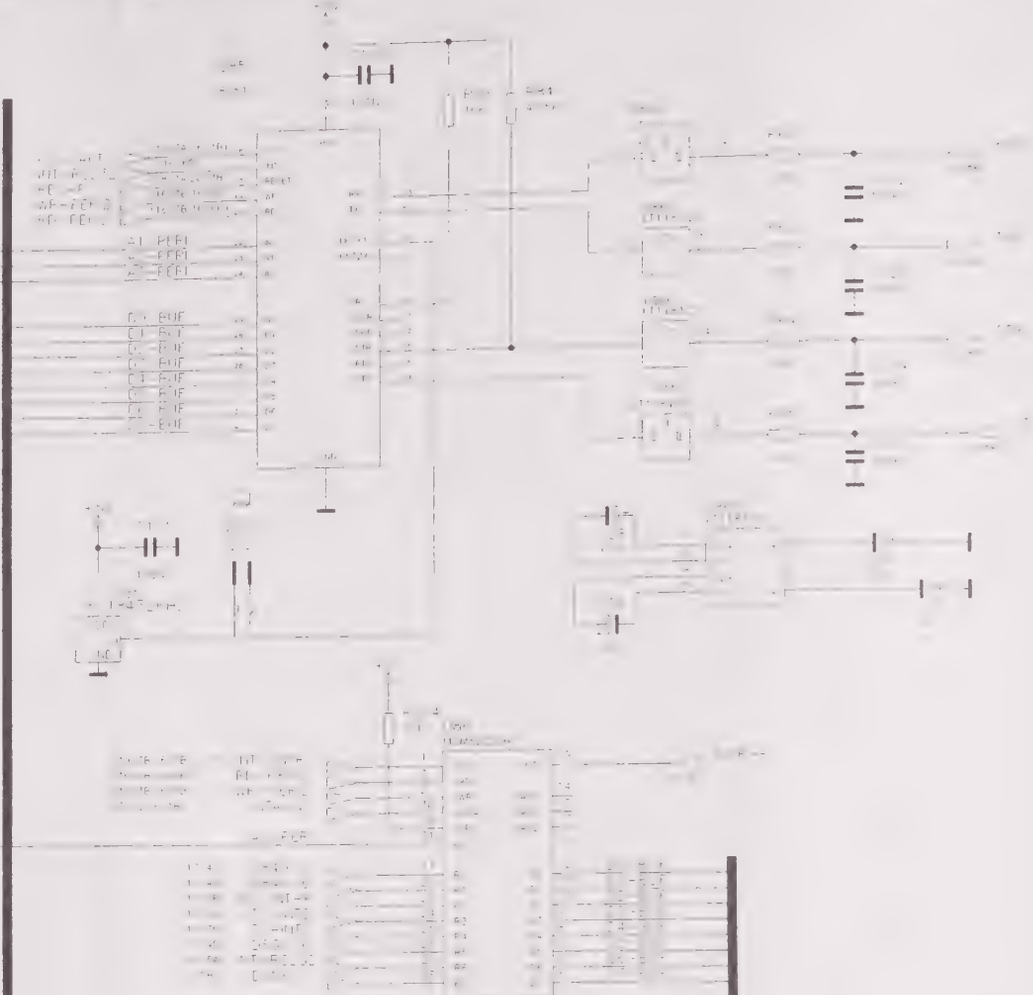

200HZ
100HZ

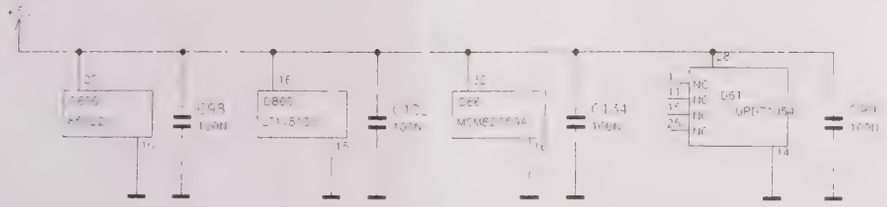

SERBUS-SYNC

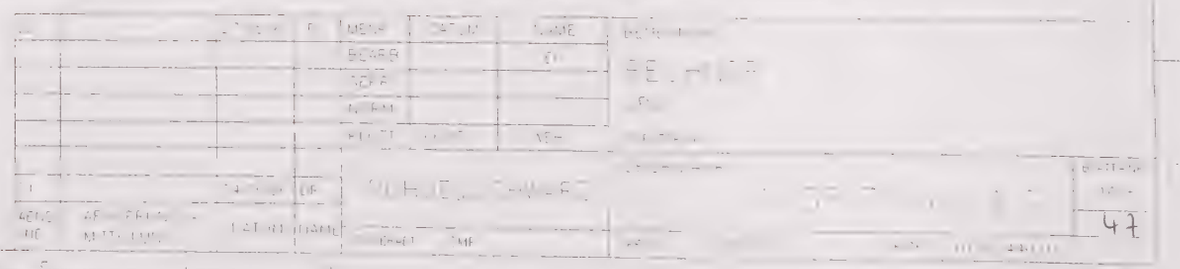


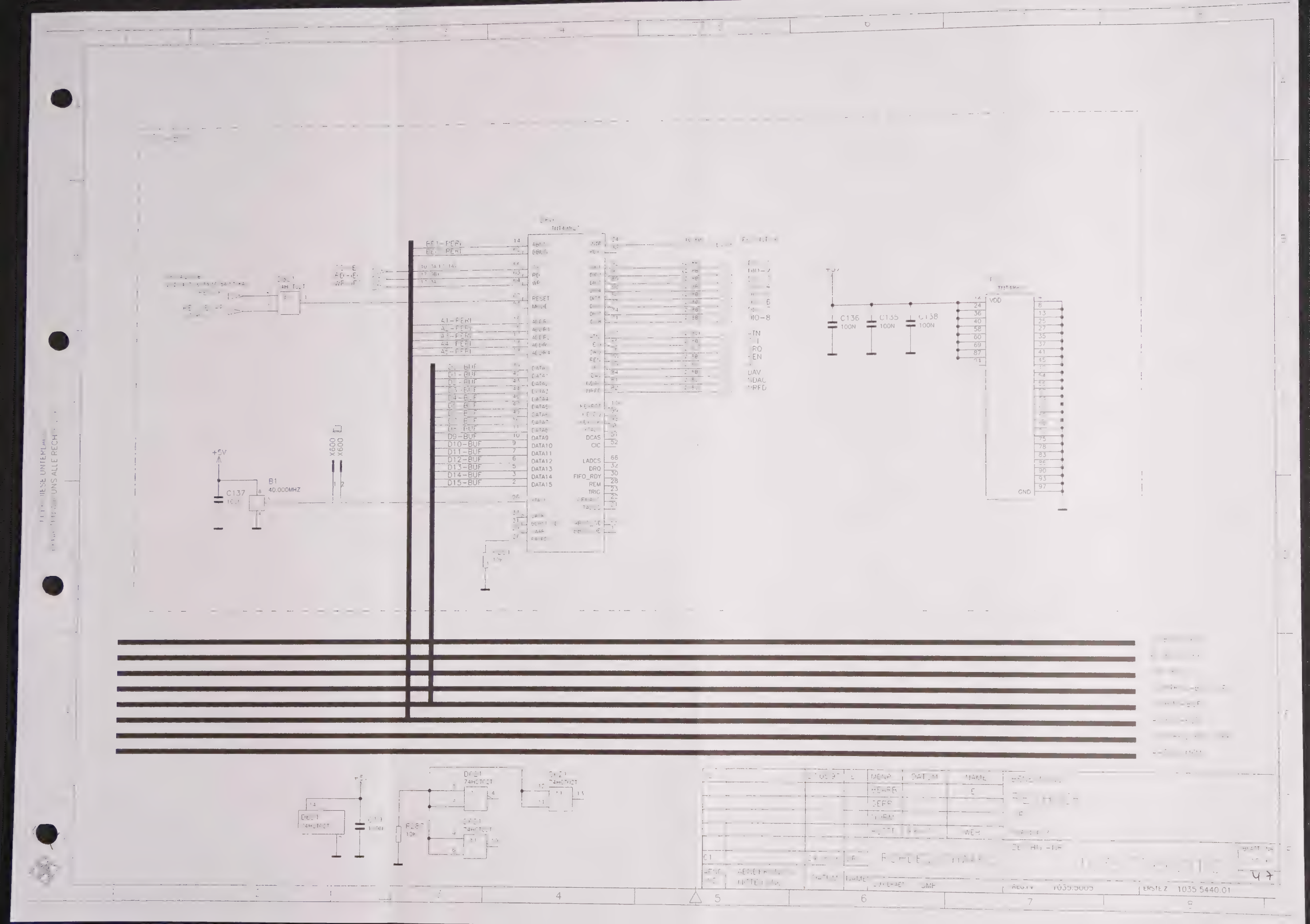
UNTERLAGE
ALLE RECHTE









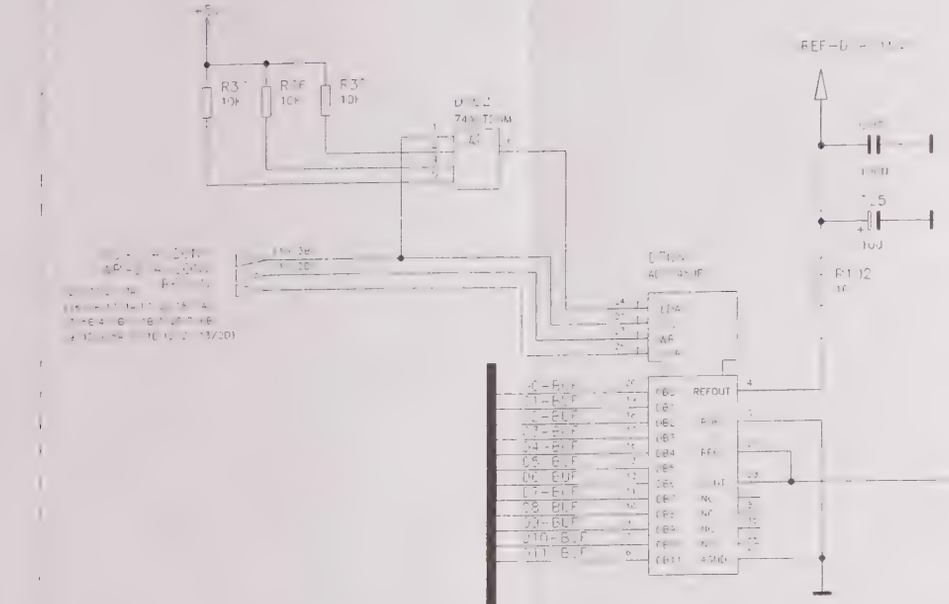


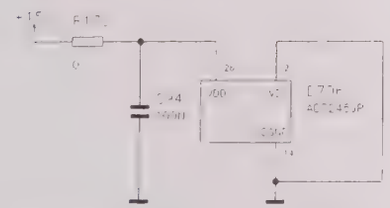
		MENR	DATUM	NAME	
		BEARB		E	
		GERR			
		NORM			
				WEH	
C1					

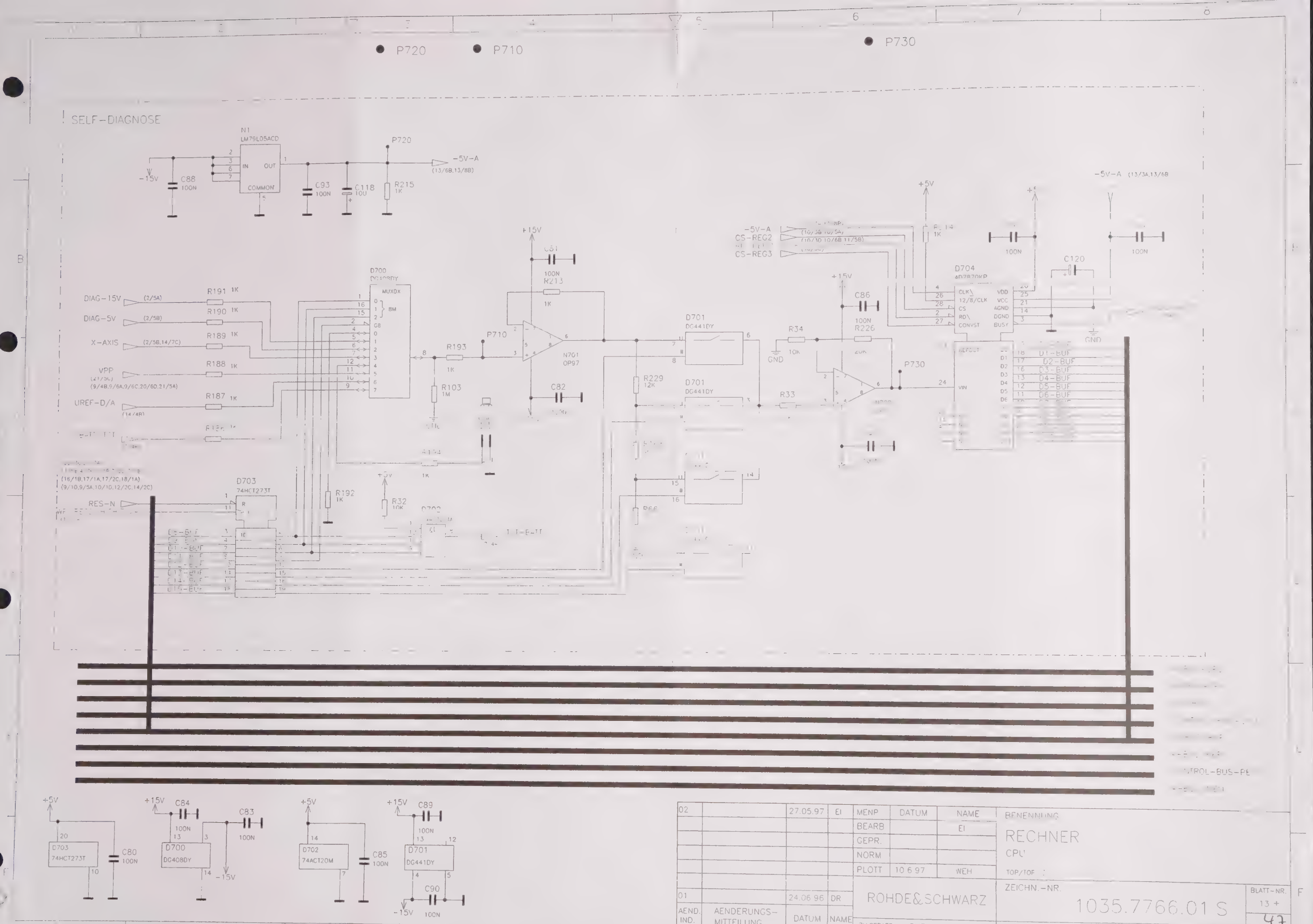
REG.TV 1035.5005 ERSTE Z 1035 5440.01

47

FÜR DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR



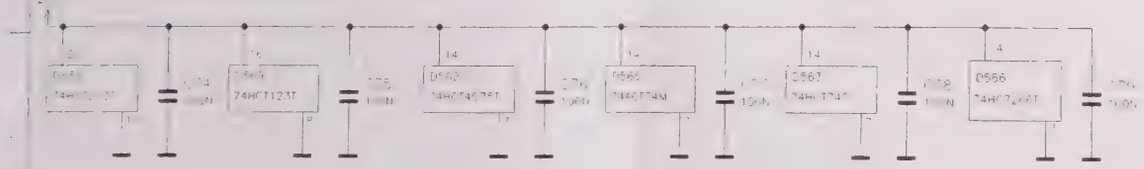




02		27.05.97	EI	MENP	DATUM	NAME	BENENNUNG
				BEARB		EI	RECHNER
				GEPR.			CPU
				NORM			TOP/TOF
				PLOTT	10 6 97	WEH	
01		24.06 96	DR	ROHDE&SCHWARZ			ZEICHN.-NR. 1035.7766.01 S
AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ZU GERAET SMP			BLATT-NR. 13 + 47
							REG.LV 1035 5005

KNOB1

KNOB2



AEZ

D500 74ACT138M

A26, A27, A28, A31, A30, A29

CS-TIMER
CS-SERBUS
CS-UART
CS-IEC
CS-LCD
CS-INTCONTR
CS-D/A-CONV

D510 74ACT138M

A1-PERI, A2-PERI, A3-PERI, A31

CS-REG1
CS-REG2
CS-REG4
CS-REG5

R210 1K

D520 74ACT32M

CS-REG3

D540 85C220

CLK1XB
AS-PERI
BLAST-PERI
W/R-PERI
BE1-PERI
BE0-PERI
RES-N

RDY-PERI1
RD-PERI1
WR-D/A-CONV
WR-PERI1-HIGH
WR-PERI1-LOW

R20 10K

D520 74ACT32M

CS-REG1, WR-PERI1-HIGH → WR-REG1-HIGH

D520 74ACT32M

CS-REG2, WR-PERI1-HIGH → WR-REG2-HIGH

D520 74ACT32M

CS-REG4, WR-PERI1-LOW → WR-REG4-LOW

+5V

R83 47.5K, R82 47.5K, R81 47.5K, R80 47.5K, R79 47.5K, R78 47.5K, R77 47.5K, R76 47.5K

CS-REG5
RD-PERI1

D4 74HCT541T

D7-BUF
D6-BUF
D5-BUF
D4-BUF
D3-BUF
D2-BUF
D1-BUF
D0-BUF

R591 1K, R592 1K, R593 1K, R594 1K, R595 1K, R596 1K, R597 1K, R598 1K

OPT. | VAR | AEZ

* Nur wenn mindestens ein Baustein D302 bis D309 vom Hersteller HYUNDAI ist:

Brücke D402.2 nach D299.6
und
R598 nicht bestückt

VAR	R592	R593	R594
04		N.F.	
06		N.F.	N.F.

AEZ	R595	R596	R597	R598
01				N.F.
02			N.F.	
03			N.F.	N.F
04		N.F.		
05		N.F.		N.F
06		N.F.	N.F.	
07		N.F.	N.F.	N.F.
08	N.F.			
09	N.F.			N.F.
10	N.F.		N.F.	
11	N.F.		N.F.	N.F
12	N.F.	N.F.		
13	N.F.	N.F.		N.F
14	N.F.	N.F.	N.F.	
15	N.F.	N.F.	N.F.	N.F.

A-BUS-CPU
AD-BUS-CPU
CONTROL-BUS-CPU
CLK-BUS
D-BUS-BUF
A-BUS-PERI
CONTROL-BUS-PERI
A-BUS-MEM

+5V

D540 85C220 — C65 100N
D510 74ACT138M — C66 100N
D500 74ACT138M — C67 100N
D520 74ACT32M — C68 100N
D4 74HCT541T — C64 100N

IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME
01		24.06.96	DR
02		06.97	E1
0203		05.98	E1

	DATUM	NAME
BEARB.		DR
GEPR.	05.98	E1
NORM		
PLOTT		

ROHDE&SCHWARZ

ZU GERAET SMP

BENENNUNG
RECHNER
CPU

ZEICHN.-NR. 1035.7766.01 S

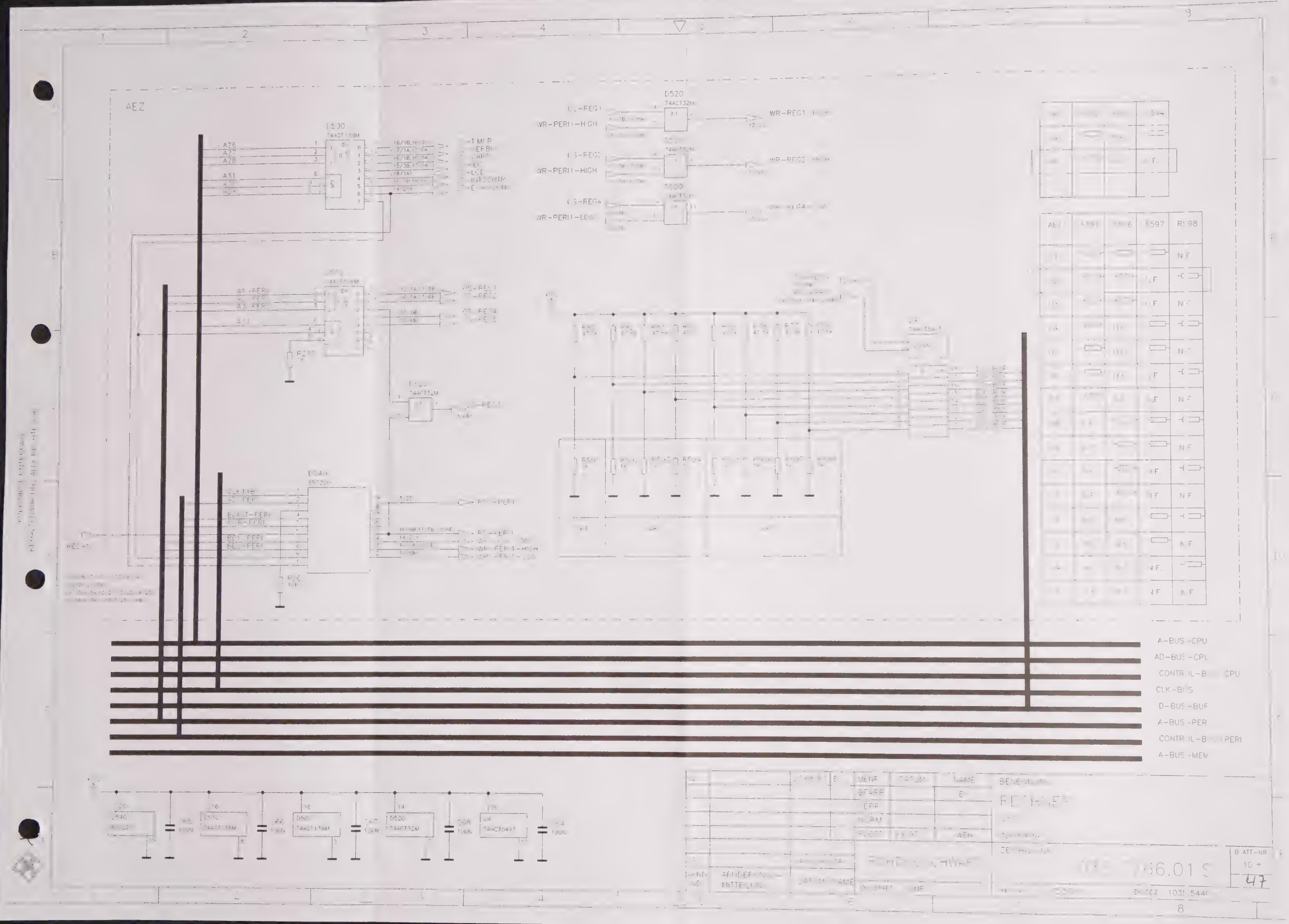
BLATT-NR. 11 +

REG.I.V. 1035.5005

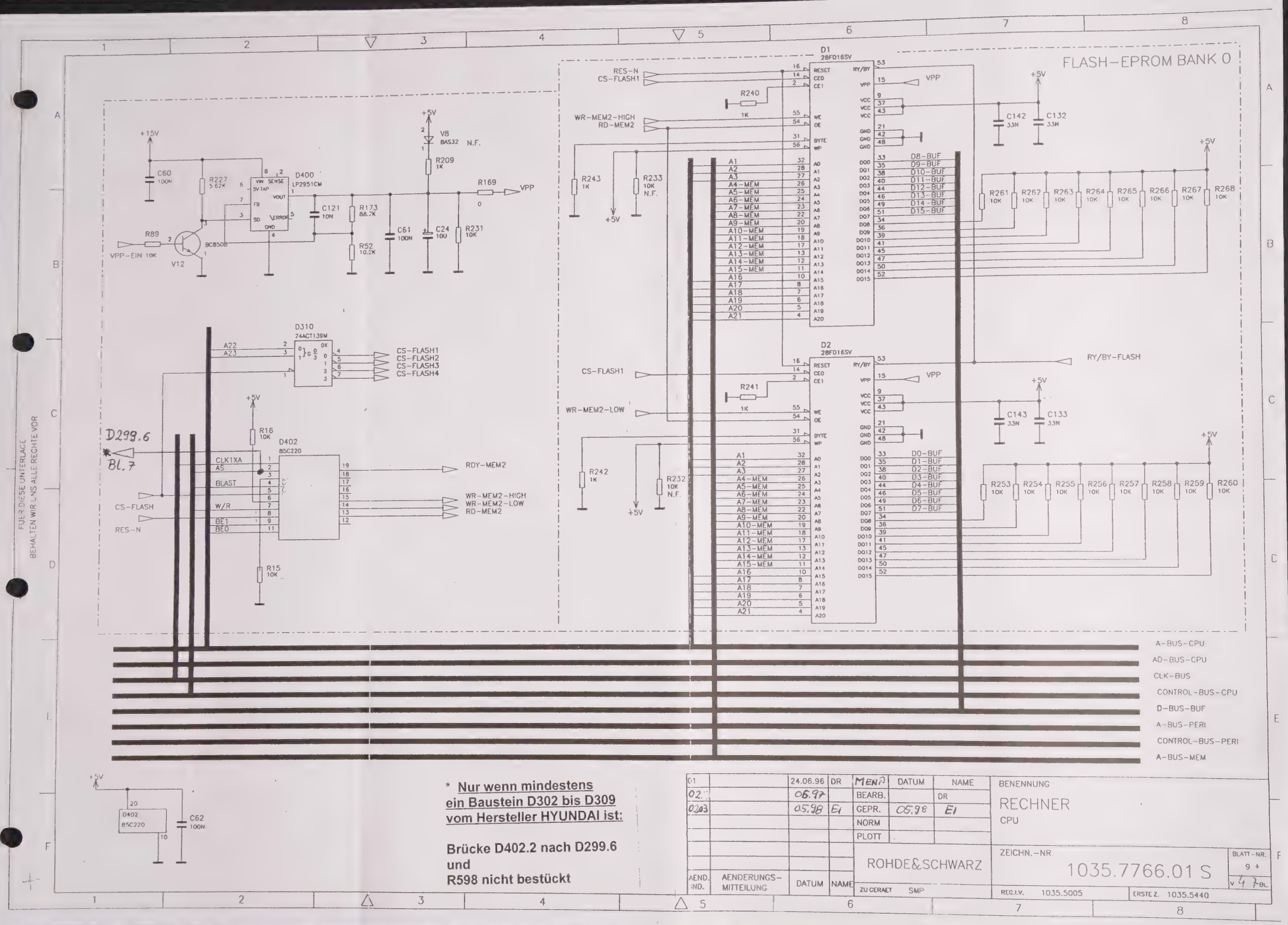
ERSTE Z. 1035.5440

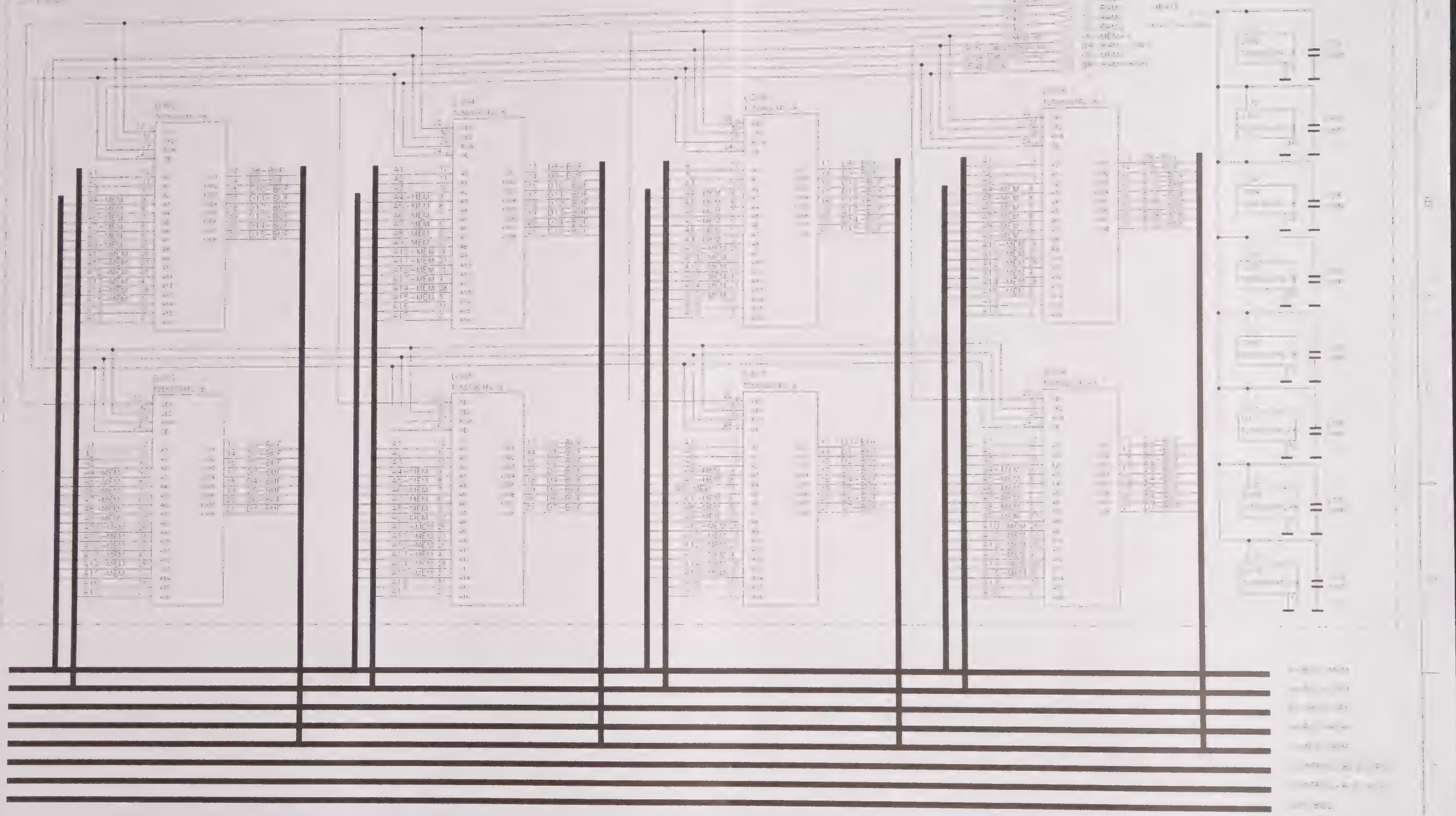
V 47 BL.

FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR



AEZ
D520
74ACT32M
WR-PERI1-HIGH
WR-REG1
WR-REG2
WR-PERI1-LOW
A26
A27
A28
A31
A-BUS-CPU
AD-BUS-CPU
CONTROL-BUS-CPU
CLK-BUS
D-BUS-BUF
A-BUS-PER
CONTROL-BUS-PERI
A-BUS-MEM


FLASH-EPROM BANK 0
D1
28F016SV
D2
28F016SV
D400
LP2951CM
D310
74ACT139M
D402
85C220
V8
BAS32
N.F.
V12
BC850B
RES-N
CS-FLASH1
WR-MEM2-HIGH
RD-MEM2
WR-MEM2-LOW
RY/BY-FLASH
RDY-MEM2
CS-FLASH
RES-N
D299.6
Bl.7
A-BUS-CPU
AD-BUS-CPU
CLK-BUS
CONTROL-BUS-CPU
D-BUS-BUF
A-BUS-PERI
CONTROL-BUS-PERI
A-BUS-MEM
FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR
* Nur wenn mindestens
ein Baustein D302 bis D309
vom Hersteller HYUNDAI ist:
Brücke D402.2 nach D299.6
und
R598 nicht bestückt
24.06.96
06.97
05.98
BENENNUNG
RECHNER
CPU
ROHDE&SCHWARZ
ZEICHN.-NR.
1035.7766.01 S
BLATT-NR.
9 +
REG.I.V. 1035.5005
ERSTE Z. 1035.5440
ZU GERAET SMP
AEND. IND.
AENDERUNGS-MITTEILUNG
DATUM
NAME



ATTENTION ESD
ELECTROSTATIC SENSITIVE DEVICE
HANDLE WITH SPECIAL HANDLING

ACHTUNG ESD
ELEKTROSTATISCH GEFAEHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG

FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

P1

UBEXT — R204 221 — V13 HSMS2800 — V9 BZV55B5V1 0.5W

+5V — V7 BAS32 — P1 — UBATT

V6 BAS32 — K1 REL1A1U — TST-BATT

X300 X300

RES-N — R12 10K — V11 BC850B — R51 475 — V2 BC860B

V14 HSMS2800 — R203 221 — O2 — G300 3.4V — O1

K1 REL1A1U — UBATT-TST — R222 39.2K

+5V — R175 2.21K — R201 27.4K — V3 BC860B — RESIN2

D106 74HC132 — EN-MEM-P

RES-N — V21 BZV55B3V3 0.5W — R224 100K — R225 100K

D402.2 BL9

+5V — R14 10K

D299 74ACT138M — A18 A19 A20 A21 — CS-RAM0 CS-RAM1 CS-RAM2 CS-RAM3 CS-RAM4 CS-RAM5 CS-RAM6 CS-RAM7

+5V — R71 47.5K — R72 47.5K — R236 47.5K — R237 47.5K

+5V — R73 47.5K — R74 47.5K — R75 47.5K

D300 85C220 — CLK1XA AS BLAST W/R BE1 BE0 — RDY-MEM1 — WR-RAM-HIGH — WR-RAM-LOW — RD-MEM1

R13 10K

CS-EPROM CS-RAM — RES-N — CS-REG-VARI

BOOTEPROM

+5V — R250 10K — BOOT-EPROM D301 27C210

RD-MEM1 CS-EPROM

A1–A16 — A4-MEM … A15-MEM

D0-BUF … D15-BUF

R208 1K +5V

A-BUS-CPU
AD-BUS-CPU
CLK-BUS
CONTROL-BUS-CPU
D-BUS-BUF
A-BUS-PERI
CONTROL-BUS-PERI
A-BUS-MEM

+5V — D300 85C220 — C51 100N — D299 74ACT138M — C50 100N — D301 27C210 — C49 100N

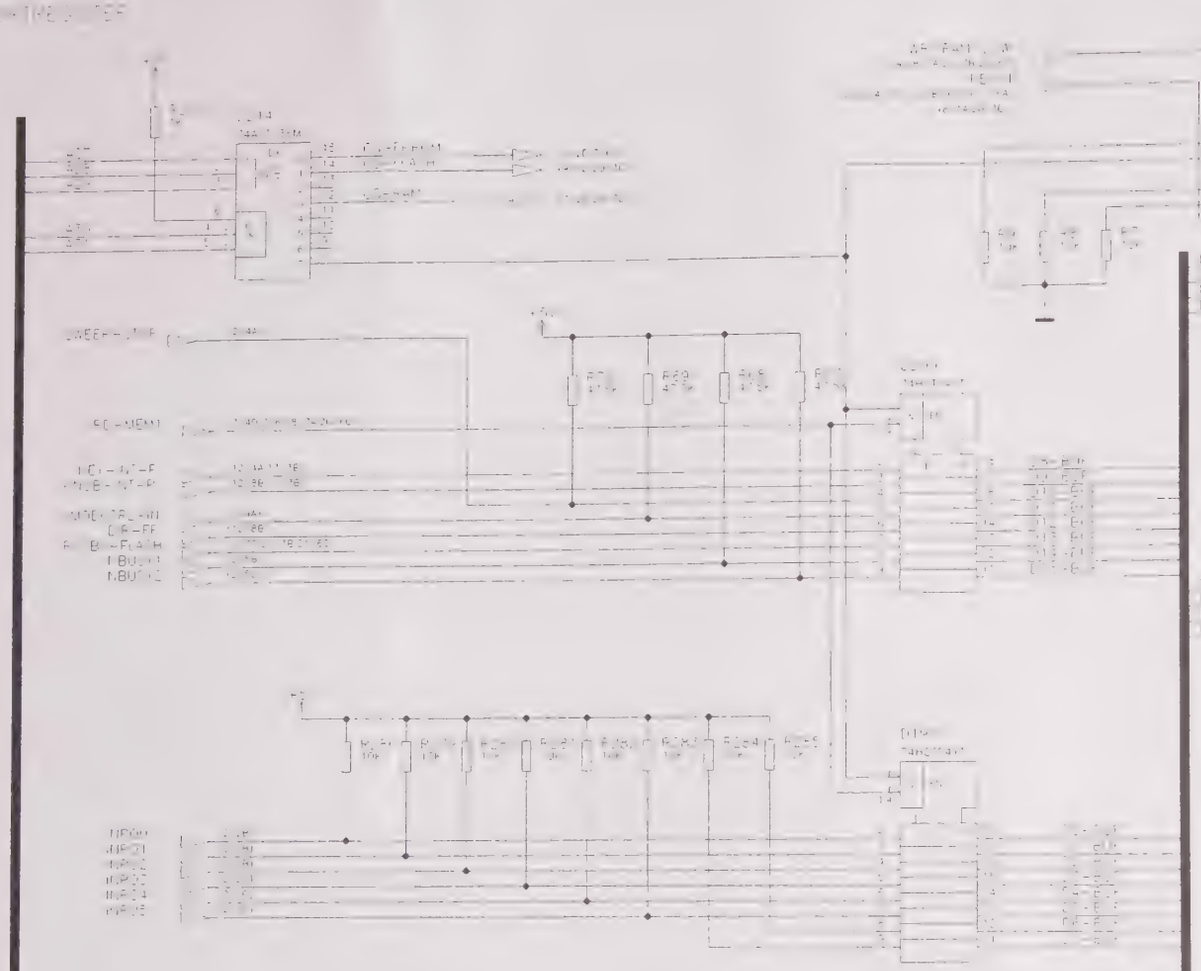
*** Nur wenn mindestens ein Baustein D302 bis D309 vom Hersteller HYUNDAI ist:**

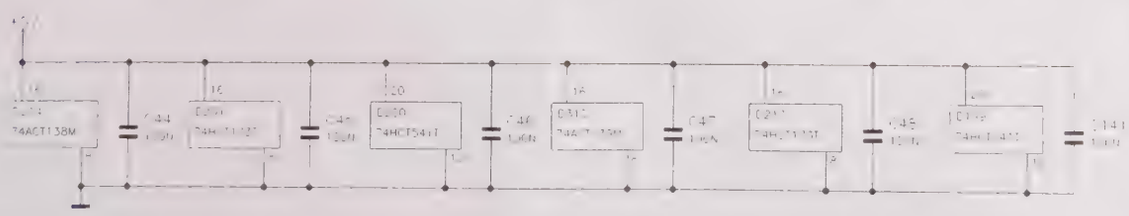
Brücke D402.2 nach D299.6 und R598 nicht bestückt

01		24.06.96	DR	MENP	DATUM	NAME	BENENNUNG
02		05.97	EI	BEARB.		DR	RECHNER
02.03		05.98	EI	GEPR.	05.98	EI	CPU
				NORM			
				PLOTT			
AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ			ZEICHN.-NR. 1035.7766.01 S
				ZU GERAET SMP			REG.I.V. 1035.5005 ERSTE Z. 1035.5440

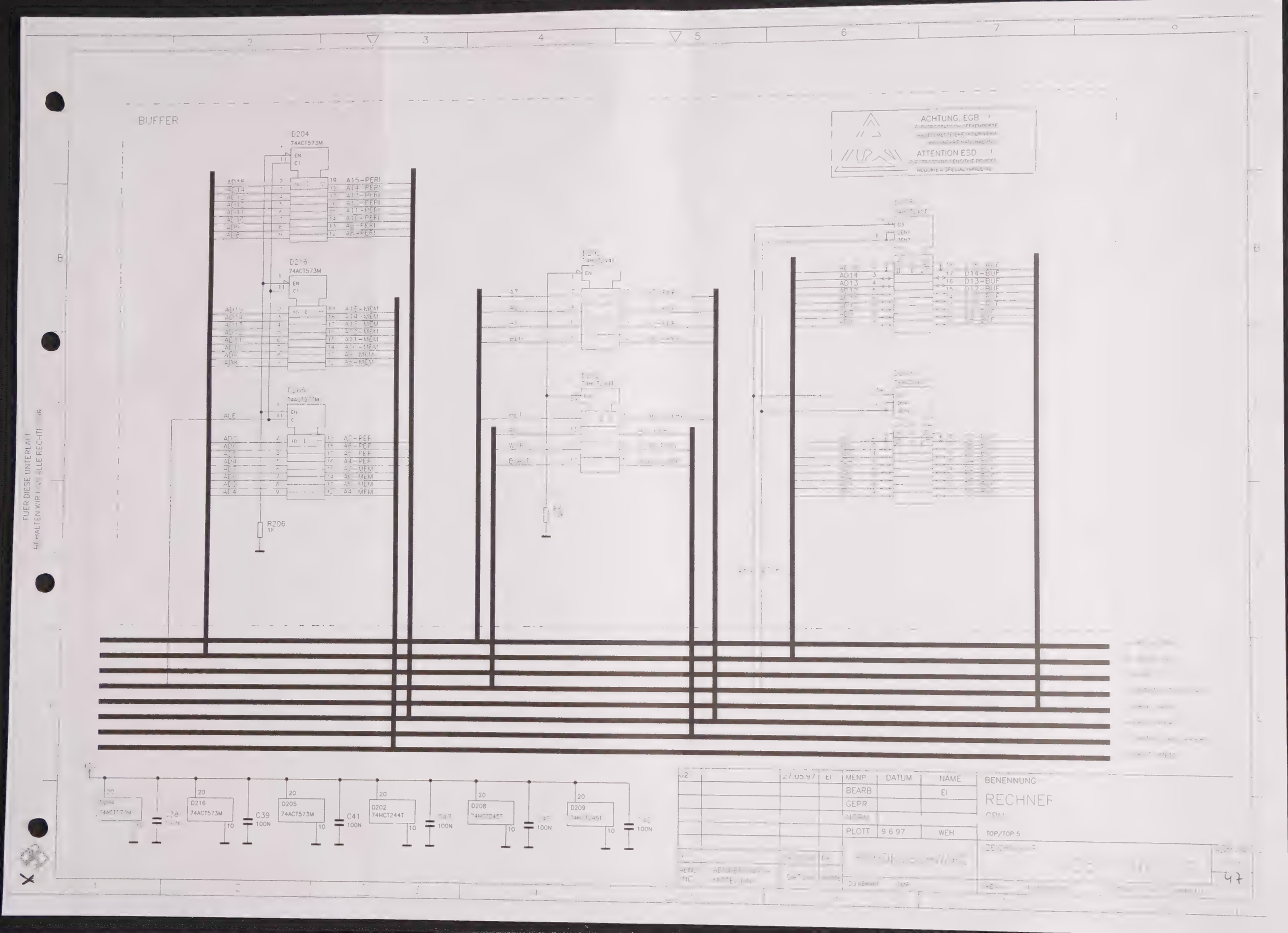
BLATT-NR. 7 + v 47 BL

... ALLE RECHTE VORB





47


BUFFER
D204
74ACT573M
D216
74ACT573M
ALE
R206
1K
ACHTUNG, EGB
ATTENTION ESD
AD14
AD13
D14-BUF
D13-BUF
D12-BUF
D216
74ACT573M
C39
100N
D205
74ACT573M
C41
100N
D202
74HCT244T
D208
D209
100N
27.05.97
MENP
DATUM
NAME
BEARB
EI
GEPR
PLOTT
9 6 97
WEH
BENENNUNG
RECHNER
TOP/TOP 5
47

FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

LAMP OFF

X5 16
X5 20
X5 1
X5 21
X5 23
X5 25

X5 2
X5 4
X5 6
X5 8

+15V

LS0 100UH 20%
C54 100N L
C50 470U 25V
C51 470U 25V
C55 100N L

X5 18 — L10 4U7H — +5V
C11 100N L
C13 100N L
C12 10U 50V.BC.

+15V — C58 100N L — N51-C pin 8

N50 LM317T
6V.....10V
C59 10N L
R50 100R L
C56 100N L
LS1 100UH 20%
C52 470U 25V
C53 470U 25V
C57 100N L
V- DC/AC — X6 4 / X6 3 / X6 2
X6 1 GND- DC/AC
ZUM DC/AC WANDLER
TO DC/AC CONVERTER

R48 10K L
V48 BC337-40 AUTOM
R49 10K L
R53 221R L
R60 1K L
R61 243R L
R54 1K L
R55 47K5 L
R56 47K5 L
V50 5V1 L
V51 4V3 L
N51-A LM2903D-L
R57 0R L
R58 0R L
N51-B LM2903D-L
C60 22U 50V.BC.
C61 47U 50V.BC.
R59 243K L
V52 BC337-40 AUTOM
POT4 — X5 10
POT5 — X5 12
POT6 — X5 14
RECHNER
R990 1K

HELLIGKEITS - STEUERUNG
BRIGHTNESS - CONTROL

+5V — DREHGEBER KNOB
R1 2K21 L
KNOB1 — CLK X5 9
E1 UGN-3020T
S1 1
R2 2K21 L
KNOB2 — DIR X5 11
E2 UGN-3020T

ZUR PERIPHERIE
TO PERIPHERIE

X10 1 VEE-LCD
X10 2 VDD-LCD
+5V
TO DISPLAY

V72 1N4007
V71 1N4007
V70 1N4007
C71 10U 50V.BC.
C72 10U 50V.BC.
C73 47U 50V.BC.
C77 2N2 L
-15V....-22V
R75 432K L
C74 47U 50V.BC.
C76 100N L
R72 4R75
R74 4R75
R73 0R L
R71 N1K 3.8% N.B
N70 LT1054CS-L
CAP+ CAP- VIN VOUT VREF OSC FB/SD NC GND NC
R76 33K2 L
C70 100U 25V.BC.
C75 100N L
POT1 — X5 3
POT2 — X5 5
POT3 — X5 7
RECHNER
R995 200K
C79 10U 25V TA L
R78 20K L
R77 39K2 L
V75 BC337-40 AUTOM
KONTRAST - STEUERUNG
CONTRAST - CONTROL

X7 6 VSS-LCD
X7 4 LCD-D0
X7 3 LCD-D1
X7 2 LCD-D2
X7 1 LCD-D3
X7 10 LCD-CS
X7 8 LCD-CP1
X7 9 LCD-CP2
LCD

X5 22 X5 24 X5 26 X5 13 X5 15 X5 17 X5 19
ZUR PERIPHERIE
TO PERIPHERIE

N.B. - NOT IN PCB

STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

ACHTUNG: EGB!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG.
ATTENTION ESD!
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING

04/	48730 90	07 04 94	JN	MEZ1	TAG	NAME
05.00		03.11.1999	KL	BEARB.		JN
				GEPR.		DR
				NORM		
				PLOTT	07.04.94	
REND. IND.	RENDERUNGS-MITTEILUNG	DATUM	NAME			

BENENNUNG
DREHGEBER
KNOB ASSEMBLY

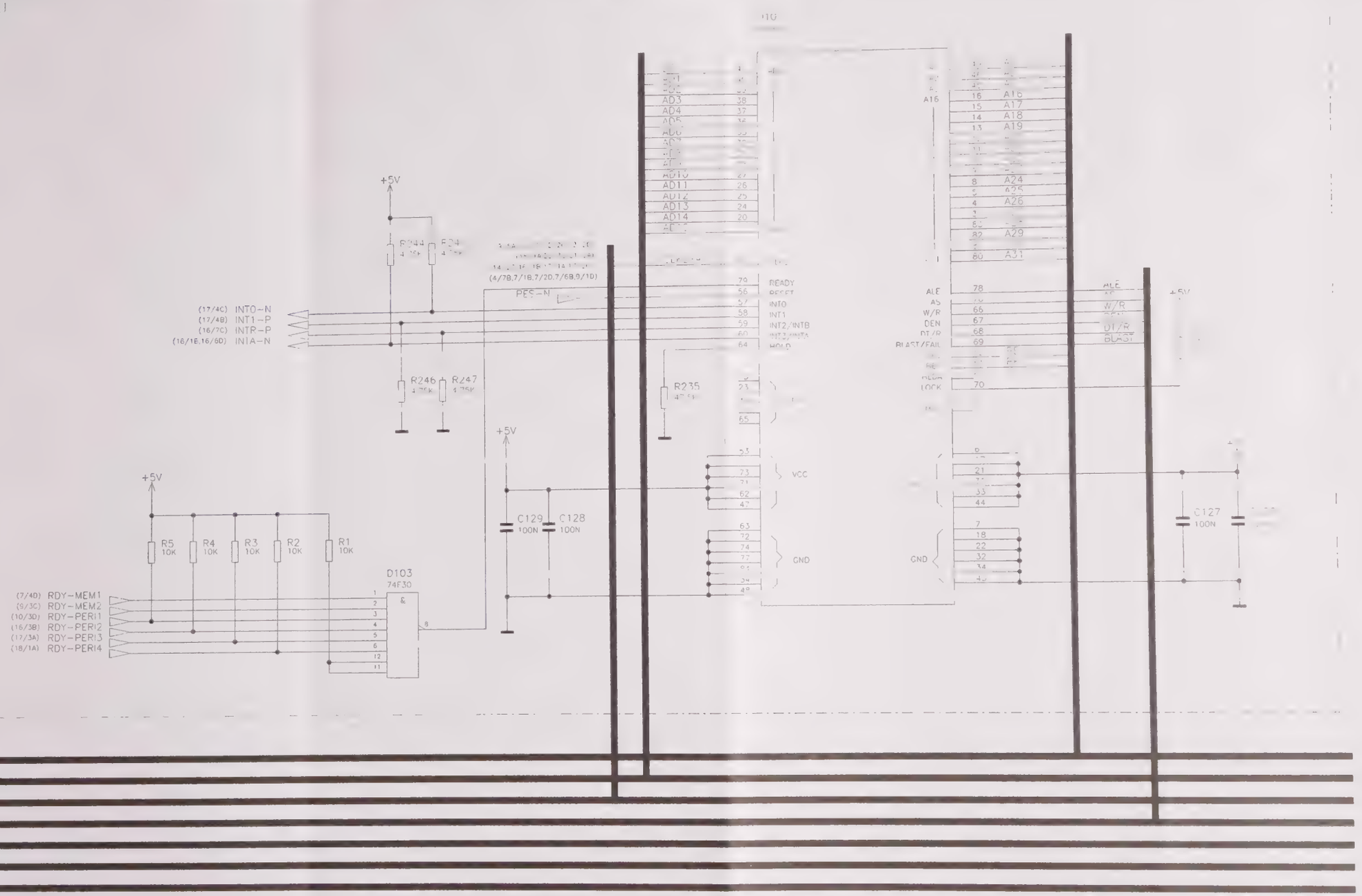
ROHDE&SCHWARZ
SMP

ZEICHN.-NR 1035.5592.01S
SLATT-NR 1
PCB.1 V 1035 5005
EPSTE 2 1035 5440

ZEICHN.-NR

FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

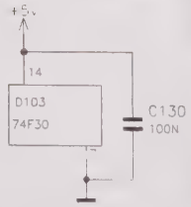
CPU



Bindende Angaben ueber Varianten, Trimmwerte, Bauteile und nicht bestueckte Bauteile siehe SA

FOR BINDING INFORMATION ON MODELS, TRIMMING AND COMPONENTS VALUES AND NONFITTED COMPONENTS SEE PARTS LIST

ACHTUNG: EGB !
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG
ATTENTION ESD !
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING



	NAME	DATUM
BEARB	EI	
GEPR.		
NORM		
PLOTT	WEH	9 6 97

RECHNER

TOP/TOP 3

ZEICHN.-NR. 1055.7766.01 5

BLATT-NR 47

...EN WIR UNS ALLE RECHT...

P21, P22
P23, P24

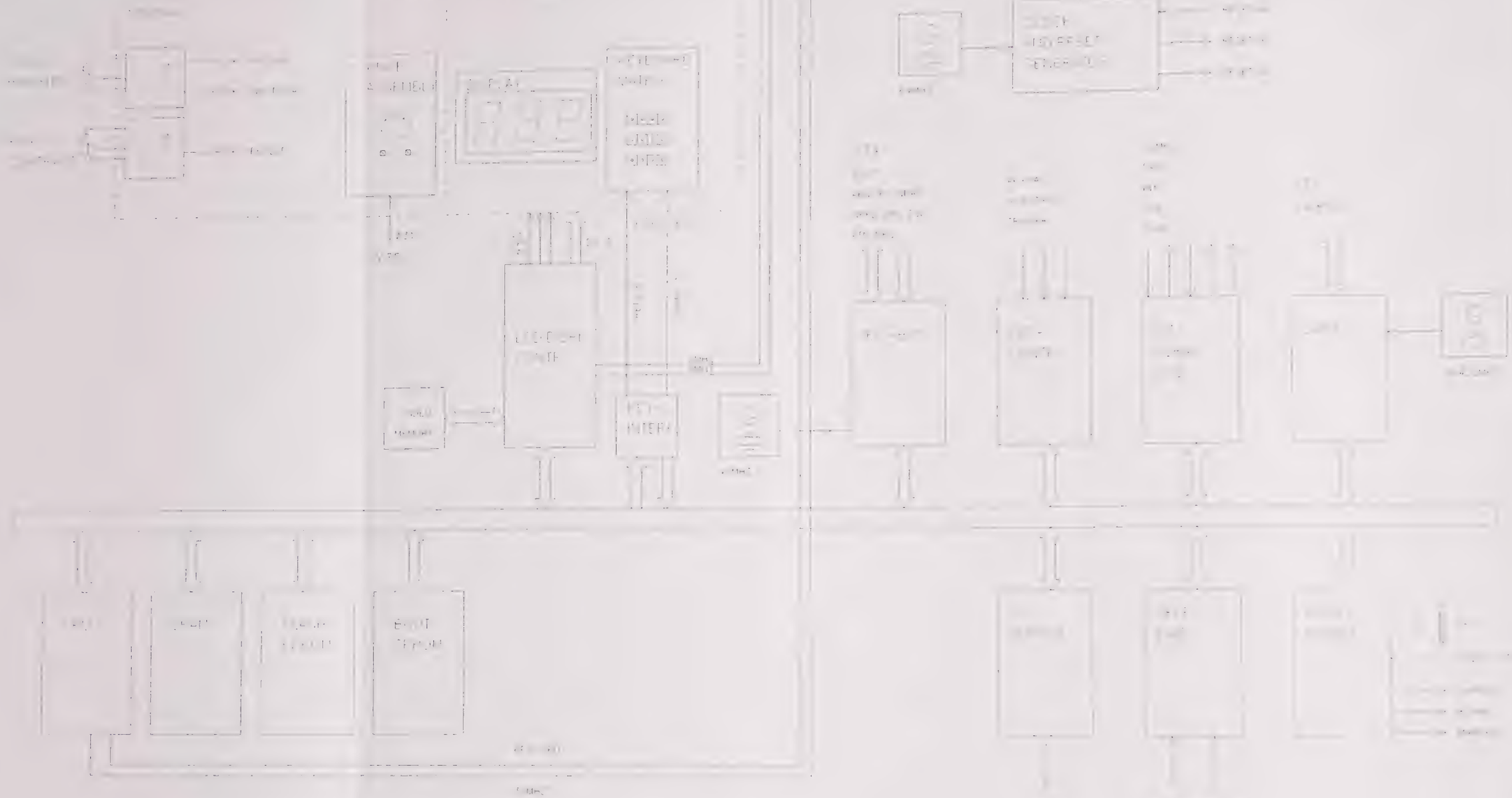
OTHERBOARD

MODCTRL-OUT
MODCTRL-IN
SWEEP-STOP
MARKER
BLANK
AC-FAIL
SYSRESET
SERBUS-SYNC
SERBUS-INT
SERBUS-DAT
SERBUS-CLK
INPO0
INPO1
INPO2
INPO3
INPO4
INPO5
POWER-SWITCH
POWER-SWITCHGND
GND

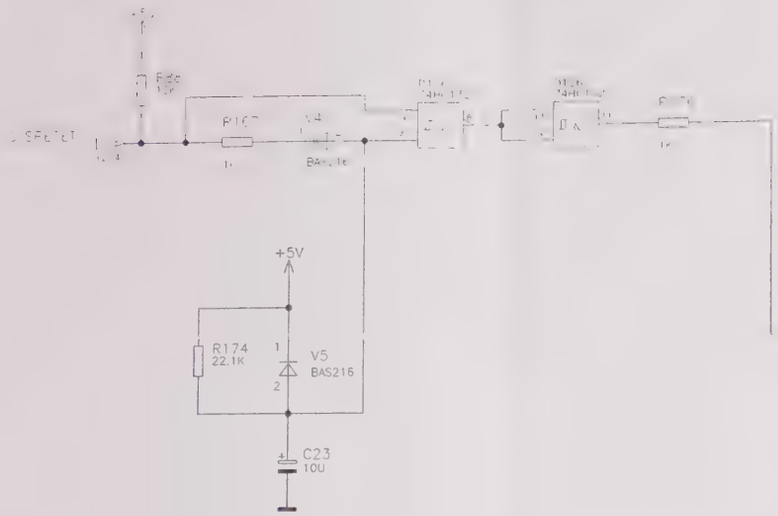
TO KEYBOARD X37

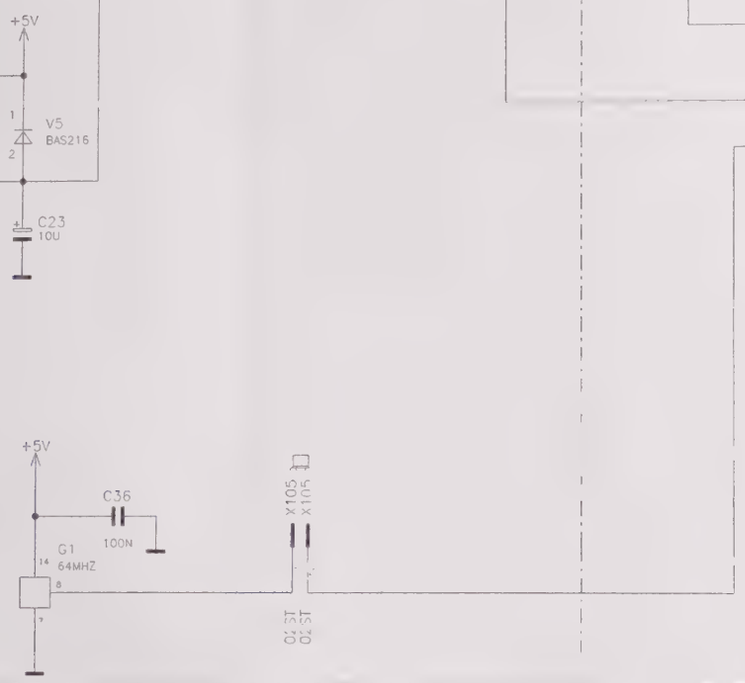
TO KEYBOARD X36

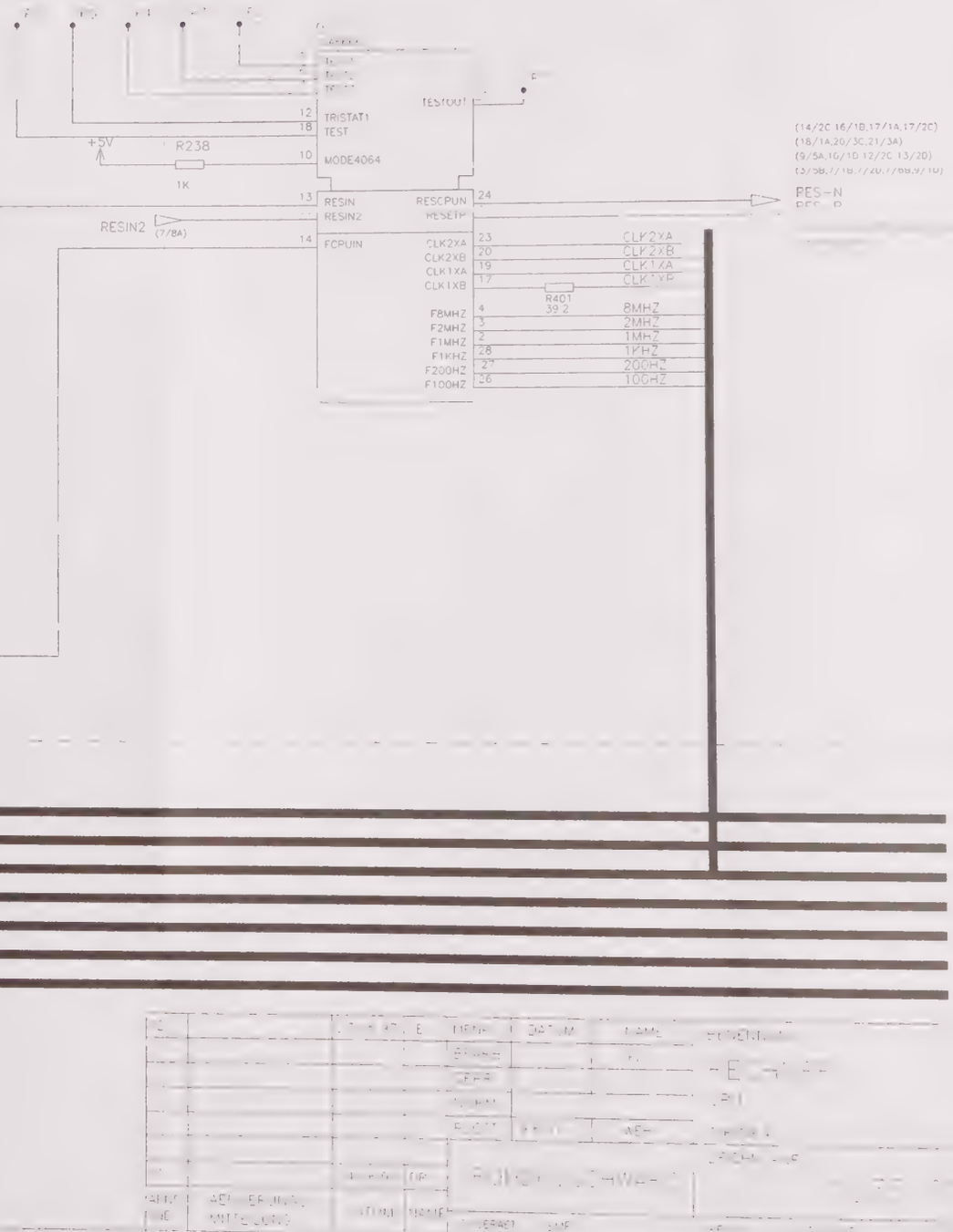
TO KNOB INTERFACE



FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR







ROHDE&SCHWARZ

SERVICEUNTERLAGEN

Frontmodul mit Rechner VAR 08

1035.5440

Variantenerklärung des Gesamtmoduls:

1035.5440.02 SMP

1035.5440.03 SME

1035.5440.04 SMT

1035.5440.05 SMIQ

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Schaltteilliste
Koordinatenliste
Stromlauf
Bestückungsplan

7. Prüfen und Instandsetzen der Baugruppe

Achtung !! Im Frontmodul sind viele betriebsnotwendige Daten gespeichert. Die im RAM gespeicherten Daten können vom Gerät selbst, die Daten im Flash-EPROM jedoch nur mit Hilfsmitteln wieder hergestellt werden. Besteht die Gefahr, den Speicherinhalt der Flash-EPROMs zu verlieren, muss sichergestellt sein, dass

1) neue Firmware geladen werden kann,

2) eine Pegelkalibration durchgeführt werden kann (Kap. 6.4 des Service-Handbuches),

3) die Kalibrierdaten des Referenzoszillators wieder hergestellt oder eine Kalibration des Referenzoszillators durchgeführt werden kann (Kap. 2.11.8 des Betriebshandbuches),

4) die Betriebsdaten im Menue UTILITIES/DIAG/PARAM wieder hergestellt werden können.

Zu 3) und 4) sollten vor Arbeiten am Frontmodul die betreffenden Daten notiert werden. Zur Wiederherstellung muss für 3) der Passwortschutz Level 2 entriegelt werden (Kap. 2.11.7 des Betriebshandbuches). Das Passwort für Level 2 ist 250751. Danach kann im Menue UTILITIES/CALIB/REF OSC der notierte Wert wieder eingegeben und gespeichert werden. Für 4) muss der Passwortschutz Level 3 entriegelt werden, das Passwort erfragen Sie bitte bei Ihrer R&S-Vertretung. Das Menue UTILITIES/DIAG/SET PARAM wird dann sichtbar und die Daten können wieder eingegeben werden.

7.1 Funktionsbeschreibung

Das Frontmodul beinhaltet die Komponenten: Rechner, Drehgeber, Tastatur und das LC-Display.
Folgende Funktionen und Eigenschaften muß der Rechner zur Verfügung stellen:

- CPU: 80960
- Batteriegepuffertes RAM
- Batterietest
- Firmware in Flash-Eprom's mit der Möglichkeit des Updates
- IEC-Bus Interface
- SERBUS Interface
- RS232 / V.24 Interface
- Timer
- Interruptcontroller
  alle Interrupts entweder in der Quelle oder am Interruptcontroller einzeln maskierbar
- ACFAIL vom Netzteil löst maskierbaren Interrupt aus
- Verarbeitung externer Triggersignale
  (TRIGGER, AUX-TRIG) Polarität wählbar
- LCD-Interface
- Helligkeits- und Kontrasteinstellung für LCD
- Drehknopf-Interface
- Anschluß für Tastaturmatrix
- Selbstdiagnose mit 12-Bit-Wandler und zwei Diagnoseeingänge (±5V & ±15V)
- X-Ausgang (0 ... 10 V)

- Varianten-/Änderungszustandserkennung
- Einige Steuerleitungen für andere Baugruppen
  (MODCTRL-OUT, MODCTRL-IN)
- Digitale Aus- & Eingangssignale
  (BLANK, MARKER, SWEEP-STOP, TASTENBEEP)
- SYS-RESET vom Netzteil löst einen Reset des Systems aus
- Standby-Schalter und Standby-LED

7.1.1 CPU: 80960

Die Verwendung des Prozessors 80960HD50 (Taktfrequ.: 50MHz) erfordert, wg. interner Verdoppelung, einen 25MHz-Takt. Dieser wird mittels Teiler von einem 50MHz-Oszillator abgeleitet. Von diesem Teiler erfolgen, wie von einem ASIC (CLKGEN D3), die Ableitungen einiger im System verwendeter Taktfrequenzen.
Da das Bus-Interface des 80960 auf BURST-Zugriffe ausgelegt ist, werden mehrere CPLD's verwendet (D300, D402, D950). Sie dienen zur Zugriffs-steuerung bzw. -geschwindigkeit der einzelnen Bausteine und zur Erzeugung des READY-Signales.
Der Datenbustreiber D5 und Adresstreiber D220-D222 isolieren den „Peripheriebus" vom „Memorybus".

7.1.2 Batteriegepuffertes RAM

Dieser Speicher wird mittels vier 512k-Bit SRAM-Speicherbausteinen (D17..D20) realisiert. Der Zugriff auf diesen Speicher wird durch das Signal RES-P blockiert, wobei in den Low-Power-Mode umgeschaltet wird.

7.1.3 Batterietest

Um den Ladezustand der Batterie zu testen, wird durch das Signal TST-BATT mittels REED-Relais ein Belastungswiderstand von 39,2kOhm an die Batterie angeschlossen. Die Spannung am Widerstand wird der Selbstdiagnoseschaltung zugeführt und gibt Auskunft über den Zustand der Batterie.

7.1.4 FLASH-EPROM's (Firmware-Update)

Um Firmware-Updates ohne Eingriff von außen durchführen zu können, werden FLASH-EPROM's als Speicher verwendet. Es sind vier Bausteine D1,D2,D11,D21_vom Type 28F016 (4M-Worte) vorgesehen.
Die zum Programmieren nötige Spannung VPP wird durch den Baustein D400 aus +15V erzeugt. Dieser Linearregler kann durch das Signal VPP-EIN an- und abgeschaltet werden.
Der Update der Firmware erfolgt über eine RS232-Schnittstelle an der Rückseite des Gerätes.
Den Urlader enthält das BOOT-EPROM (D301). Es erlaubt das Bestücken der FLASH-EPROM's als unprogrammierte Standardbauteile.

7.1.5 IEC-Bus Interface

Als IEC-Bus-Controller wird der Baustein TNT4882C (D60) verwendet. Damit können auch alle Controller-Fähigkeiten des IEC-Bus realisiert werden. Seine 40MHz-Taktfrequenz erhält er von einem eigenen Quarzoszillator.

7.1.6 SERBUS-Interface

Für die Ansteuerung und Programmierung der einzelnen Baugruppen wird ein von R&S eigens entwickeltes serielles Bussystem (SERBUS) verwendet. Hierfür existieren bisher zwei Standard-ASIC's (SERBUS-M und SERBUS-D).
Auf dem Rechner befindet sich der Bus-Master-Baustein (SERBUS-M / D87). Er wird wortweise programmiert und mit einer Taktfrequenz von 20MHz betrieben. Zur seriellen Datenübertragung an die Baugruppen wird 4MHz verwendet.

7.1.7 RS232- / V.24-Interface

Dieses Interface ist mit dem Controller-IC 16C550 (D85) realisiert. Die Pegelumsetzung von TTL auf RS232 erfolgt im Baustein LT1181 (D860).

7.1.8 Timer

Der Baustein uPD71054(D61) enthält drei 16-Bit Timer. Um lange Zeiten mit hoher Auflösung realisieren zu können, sind zwei dieser Timer kaskadiert (Timer1 und Timer2). Als Eingangstakt stehen 1kHz für Timer0 und 1MHz für Timer1/2 zur Verfügung.

7.1.9 Interruptcontroller

Der verwendete Interruptcontrollers ist in der CPU80960 integriert. Die dynamischen Interruptquellen sind direkt angeschlossen. Die statischen werden über Gatter D827 zusammengeführt, und an den Int-eingang XINT7 der CPU gelegt. Sie können einzeln maskiert und über den Bus ausgelesen werden.

7.1.10 ACFAIL,SYSRESET

Das Signal ACFAIL wird im Netzteil erzeugt und ist eines der statischen Interruptsignale, welche nicht an der Quelle maskierbar ist. Die Maskierung erfolgt wie bei vorherigem Punkt beschrieben.

SYSRESET (ebenfalls vom Netzteil) wird über D106 an den Reset-Baustein MAX793 (D15) geführt und löst dort die Resetschaltung aus. Zugleich wird über R264 und V4 der Kondensator C55 entladen. Wird das Signal SYSRESET wieder HIGH, lädt sich C55 über R265 auf und gibt nach Erreichen der Schwellspannung von D106 den Reseteingang wieder frei.

7.1.11 Verarbeitung externer Triggersignale

(TRIGGER, AUX-TRIG) Polarität wählbar

Die Polarität des Triggersignales kann für beide Triggersignale getrennt an Port D810 eingestellt werden und erfolgt durch EXOR-Verknüpfung des Portsignales mit dem Triggersignal (D840).

7.1.12 LCD-Interface

Zur Ansteuerung des LC-Displays wird der LCD-Controller SED1351F (D90) von SEIKO EPSON verwendet. Der Bildspeicher besteht aus den beiden SRAM's D960 und D970. Dieser Speicher ist ausreichend für vier Bildschirmseiten (640 x 200).

Um eine lineare Adressierung der Pixel (Pixel 0 ist LSB der untersten Adresse) zu erhalten, wurde der Datenbus an D90 byteweise in sich gespiegelt.
Zur Erhöhung der Treiberfähigkeit und zur Isolation des Bausteines D90 werden die Daten- und Clock-Signale für das LCD über D980 geführt.

7.1.13 Helligkeits-und Kontrasteinstellung für LCD

Leiterplatte: Drehgeber (1035.5592.01)

Die Helligkeitseinstellung erfolgt über die Eingangsspannung des DC/ACÄWandlers für die CFL-Beleuchtung. Die Eingangsspannung für diesen Wandler darf im Bereich von +6V bis +10V liegen. Höhere Spannung bedeutet höhere Helligkeit. Die Spannungsregelung erfolgt mittels eines LM317T (N50), und die Einstellung der Ausgangsspannung wird mit R990 vorgenommen.
Beim Einschalten des Gerätes ist es aber für ein sicheres Zünden der Leuchtstoffröhren nötig, die Eingangsspannung des Wandlers auf +10V zu bringen. Hierzu dient die Schaltung aus N51 und V52, die nach dem Einschalten kurzzeitig +10V zur Verfügung stellt.
Zum Verbessern der Störabstrahlung des AC/DC Wandlers bzw. der Leuchtstoffröhren kann mit V48 die Beleuchtung ausgeschaltet werden.
Die Einstellung des Kontrastes erfolgt über die negative Versorgungsspannung VEE des LC-Displays. Diese Spannung wird mittels eines Switch-Capcitor-Voltage-Converters mit Regler (LT1054/N70) aus +15V erzeugt und kann mittels R995 im Bereich von -15V bis -22V eingestellt werden.
Zur Filterung der Störungen des DC/AC-Wandlers und des Converters LT1054 befinden sich noch zwei LC-Filter in pi-Form auf dieser Leiterplatte.

7.1.14 Drehknopfinterface

Bei jedem Pegelwechsel des Signales KNOB2 (CLK) wird über die Laufzeitkette aus D566C/D und D562B/C am EXNOR-Gatter D566B ein LOW-Puls erzeugt. Mit diesem Puls wird die Richtungsinformation im Flip-Flop D565B gespeichert und mit D565A ein Interrupt ausgelöst.

7.1.15 Anschluß für die Tastaturmatrix

Die Spaltenleitungen der Tastaturmatrix werden am Register D550, die Zeilenleitungen am Port D560 angeschlossen.
Solange keine Taste betätigt wird,liegen die angeschlossenen Zeilenleitungen über die Pull-Up-Widerstände R90...R96 auf HIGH-Potential. Die Spaltenleitungen werden von den Registerausgängen auf LOW-Potential gehalten. Wird nun eine Taste betätigt, wird die zugehörige Zeilenleitung auf LOW-Potential gebracht. Nach Entprellung wird ein Interrupt erzeugt, woraufhin nacheinander die Spalten einzeln auf LOW-Potential gelegt werden und an Hand des Pegels erkannt wird, welche Taste betätigt wurde.

7.1.16 Diagnose A/D-Wandler

mit 12-Bit-Wandler und zwei Diagnoseeingängen (±5V & ±15V)

Die beiden Diagnoseeingänge und einige Meßpunkte des Rechners werden über den Multiplexer D700, Impedanzwandler N701 und Eingangsverstärker dem A/D-Wandler D704 zugeführt.
Folgende Spannungen für Vollaussteuerung des A/D-Wandlers sind einstellbar: ±15V, ±5V und ±1V.
Die Wandlungszeit (max. 9us) zeigt der ADC am BUSY-Ausgang an, welcher über D570 (Port1) eingelesen werden kann.
Für Zwecke der Selbstdiagnose können folgende Spannungen mit dem Selbstdiagnosewandler gemessen werden:

die Spannung des X-Ausgangs
die Referenzspannung des D/A-Wandlers
die Batteriespannung

Es existiert zudem die Möglichkeit an Stelle der Kurzschlußbrücke X85 Meßkabel anzuschließen und damit beliebige Meßpunkte an den A/D-Wandler anzuschließen. Dabei ist allerdings zu beachten, daß die Meßspannung ±15V nicht überschreitet.

7.1.17 X-Ausgang

Der X-Ausgang erzeugt beim Sweep ein Ausgangssignal von 0V (Sweepanfang) bis 10V (Sweepende), welches zur Ansteuerung von externen Geräten genutzt werden kann. Dieses Signal wird vom Prozessor durch entsprechende Einstellung des D/A-Wandlers D706 in Abhängigkeit vom Sweep generiert. Dem Schutz vor Überspannung dienen der Widerstand R223 und die Dioden V10.

7.1.18 Varianten-/Änderungszustandserkennung

Dazu dient der Port D4. Je nach Bestückung der Widerstände R592 bis R594 können die verschiedenen Varianten kodiert werden. R595 bis R598 sind zur Kodierung des Änderungszustandes vorgesehen.

7.1.19 Steuersignale, Tastenbeep

Die Signale MODCNTL-OUT und MODCNTL-IN ermöglichen eine Synchronisation zwischen dem Signalprozessor der Baugruppe Modulationsgenerator und dem Prozessor.
Die Ausgangssignale BLANK und MARKER sowie das Eingangssignal SWEEP-STOP dienen zur Steuerung- und Synchronisation von und mit externen Geräten.
Das Ausgangsport D213 liefert das Steuersignal (LAMP-OFF) für die Beleuchtungsabschaltung der Leuchtstoffröhren.
Zum Erzeugen eines Tastenbeep ist der Piezosummer U1 vorgesehen.

7.1.20 Standby Schalter und -LED

Der an der Frontseite des Generators angebrachte Standbyschalter wird direkt am Rechner angeschlossen und über das gemeinsame Flachbandkabel aufs Motherboard herausgeführt.
Die Standby-LED wird so zwischen +15V und VS12-P geschaltet, daß bei fehlenden +15V ein Strom von VS12-P über die LED auf die virtuelle Masse der +15V fließen kann.

7.2 Meßgeräte und Hilfsmittel

Oszilloskop	100MHz	z.B. BOL
DC-Multimeter	0....+-30V, Ri>1MOhm	z.B. UDL33
DC-Spannungsquelle	..10V	z.B. NGT20

7.3 Fehlersuche

Standby-LED bleibt dunkel	Prüfen der Standby-Spannung an X312.5
Nach dem Einschalten bleibt LC-Display dunkel	Prüfen der Spannung des DC/AC-Wandlers nach 7.4.1
Keine Kontrasteinstellung möglich	Prüfen der Kontrastspannung nach 7.4.2
Drehgeber funktioniert nicht	Prüfen der Pulse des Drehgebers nach 7.4.3
Keine Anzeige nach dem Einschalten	Prüfen des RESET-Signales nach 7.4.4
	Prüfen des ACFAIL-Signales nach 7.4.4
Keine Spannung an X-AXIS	Prüfen des Ausganges X-AXIS mit Diagnose nach 7.4.6
	Prüfen der Referenzspannung mit Diagnose nach 7.4.6
Keine Datenspeicherung nach dem Geräteabschalten	Prüfen der RAM-Spannung mit Diagnose nach 7.4.6

7.4 Prüfen und Abgleich

7.4.1 Prüfen der Versorgungsspannung des DC/AC-Wandlers

Baugruppe Drehgeber:
Am Stecker X6.4 ist in Abhängigkeit der Stellung des Helligkeitsreglers an der Gerätefrontseite die DC-Spannung zu messen: Sollwert: 6V...10V.

7.4.2 Prüfen der Kontrastspannung

Baugruppe DREHGEBER:
Am Stecker X7.5 und X10.5 ist in Abhängigkeit der Stellung des Kontrastreglers an der Gerätefrontseite die DC-Spannung zu messen: Sollwert: -15V...-22V.

7.4.3 Prüfen des Drehgebers

Baugruppe RECHNER:
Oszilloskop an X35.9 und X35.11 anschließen.
Drehgeber drehen. Es müssen 2 zeitversetzte Signale zu messen sein.

7.4.4 Prüfen des RESET und ACFAIL-Signales

Baugruppe RECHNER:
Oszilloskop an X31.35 und D15 PIN15 anschließen.
Unmittelbar nach dem Einschalten des Gerätes muß beim ACFAIL-Signal ein L->H-Übergang stattfinden. Nach ca. 200-300ms muß das RESET-Signal (RES-N) den Pegelwechsel L->H zeigen. Beide Signale müssen bei allen Bedienzuständen den H-Pegel beibehalten.

7.4.5 Prüfen des Diagnosezweiges

- Einstellungen: **TPOINT 4**
- An X85 eine DC-Spannung von 0,5V einspeisen.

_ Prüfen der Spannung an P710: 0,5V und P730: 1,5V.

7.4.6 Prüfen und Auslesen der Diagnosemeßpunkte

TPOINT	Spannung	Bedeutung
0	0mV...50mV	Referenzpunkt
1	-15V...15V	DIAG -15V
2	-15V...15V	DIAG -5V
3	0V...10V	X-AXIS
4	-15V...15V	Voltmeter
6	4.9V...5.1V	Referenzspannung X-D/A
7	3.2V...4.0V	Batteriespannung

7.4.7 Prüfen der Position der Steckbrücken

Steckbrücke	Position	Bemerkung
X105	1 - 2	Clock (Peripherie)
X106	1 - 2	Clock (CPU)
X111	2 - 3	Adr. Flash
X112	2 - 3	Adr. Eprom
X300	1 - 2	Batterie
X2	1 - 2	+5V-Spannung
X85	1 - 2	Voltmeter
X3	2 - 3	Timer-Int
X700	1 - 2	Clock (RS232)

7.5 Zerlegung und Zusammenbau

Die 4 Schrauben an der Geräte-Vorderseite entfernen. Das Modul vorsichtig nach vorne klappen, um die Kabelverbindungen W20, W313 und W314 lösen zu können. Nach Trennen von W31 (Flachbandkabel z. Motherboard) kann das Frontmodul herausgenommen werden. Der rückseitige Blechdeckel ist mit 6 Schrauben befestigt. Die Platine RECHNER kann nach Entriegeln der Buchsen X36, X37 und Trennen der beiden Folien sowie der Buchse an X312 vorsichtig herausgenommen werden. Abschließend das Flachbandkabel W35 zur Leiterplatte DREHGEBER lösen.

Ausbau der LP DREHGEBER: Den Drehknopf abnehmen, und die Verbindung an X6 (z. DC/AC-Wandler) und X7 (Flachfolie z. LCD) trennen. 12pol. Buchsenhalter des Kabels W10 am LCD abziehen. Die LP kann nach Abschrauben von 4 Schrauben herausgenommen werden.

Ausbau des LCD: Kabel W10 sowie Flachfolie zur LP DREHGEBER an X7 abziehen. 4pol. Steckverbindung vom DC/AC-Wandler zur CFL-Beleuchtung auftrennen. Das LCD ist mit 4 Schrauben am Gußgehäuse befestigt und kann komplett herausgenommen werden.

Der Zusammenbau geschieht in umgekehrter Reihenfolge. Vor dem Zuschrauben des Deckels ist auf den korrekten Sitz der Baugruppe RECHNER zu achten, insbesondere auf das Anliegen der Dichtschnur.

7.6 Externe Schnittstellen

7.6.1 Schnittstelle Rechner

Pin	Name	Ein/Ausgang	Herkunft/Ziel	Wertebereich	Signalbeschreibung
X31.1 ...6	VD-5P	Eingang	A2, POWS	5.10V...5.25V max. 3000mA	Versorgungsspannung digital
X31.11, 12	VA15-P	Eingang	A2, POWS	14.7V...15.9V max. 660mA	Versorgungsspannung analog
X31.15	VA15-N	Eingang	A2, POWS	-15.9V...-14.7V max. 50mA	Versorgungsspannung analog
X31.27	VS12-P	Eingang	A2, POWS	11.6V...12.4V	Standby-spannung
X31.7,8 9,10,13 14,16					Masse digital
X31.19, 20					Masse analog
X31.26 X312.2	POWER-SWITCH	Ausgang	A2, POWS		Schalterkontakt
X31.25 X312.1	POWER-SWITCH-GND	Ausgang	A2, POWS		Schalterkontakt
X312.5	STBY-LED1	Ausgang	A2, POWS		Anode Standby-LED
X312.3	STBY-LED2	Eingang	A2, POWS		Kathode Standby-LED
X312.4	N.C.				Codierung
X31.40	SERBUS-CLK	Ausgang		HCMOS-Pegel	Serbus-Clock
X31.39	SERBUS-DAT	bidir.		HCMOS-Pegel	Serbus-Daten
X31.37	SERBUS-SYNC	Ausgang		HCMOS-Pegel	Serbus-Synchronisation
X31.38	SERBUS-INT	Eingang		HCMOS-Pegel	Serbus-Interrupt
X31.28	RES-P	Ausgang		HCMOS-Pegel	Reset
X31.44	DIAG-5V	Eingang		-5V...5V	Diagnose
X31.43	DIAG-15V	Eingang		-15V...15V	Diagnose
X31.42	TRIGGER	Eingang	Rückwand	HCMOS-Pegel	Trigger
X31.41	AUX-TRIG	Eingang	Rückwand	HCMOS-Pegel	Trigger
X31.36	SYSRESET	Eingang	A2, POWS	HCMOS-Pegel	System-Reset
X31.35	ACFAIL	Eingang	A2, POWS	HCMOS-Pegel	Powerfail
X31.34	BLANK	Ausgang	Rückwand	HCMOS-Pegel	Steuersignal
X31.33	MARKER	Ausgang	Rückwand	HCMOS-Pegel	Steuersignal
X31.32	SWEEP-STOP	Eingang	Rückwand	HCMOS-Pegel	Steuersignal
X31.30	MODCTRL-OUT	Ausgang	A5, MGEN X5.2	HCMOS-Pegel	Steuerung Modulationsgenerator
X31.31	MODCTRL-IN	Eingang	A5, MGEN X5.1	HCMOS-Pegel	Steuerung Modulationsgenerator
X31.45	X-AXIS	Ausgang	Rückwand	0...10V	Frequ.prop. Spannung
X31.47	DONE	Eingang		HCMOS-Pegel	Interrupt-Signal
X31.17, 18 21..24	INPO0.. ..INPO5	Eingang		HCMOS-Pegel	
X31.46	UBEXT	Eingang		0...5V	ext. Batt.anschluß
X37.1	RET0..	Eingang	Drehgeber	HCMOS-Pegel	Tastatur

...7	RET6				
X37.8 ...13	SCAN0 ...SCAN5	Ausgang	Drehgeber	HCMOS-Pegel	Tastatur
X36.1 ..13	"GND"			1kOhm Pulldown	Tastatur
X33.6	CTS	Eingang	Rückwand	RS232-Pegel	Serielle Schnittstelle
X33.3	RXD	Eingang	Rückwand	RS232-Pegel	Serielle Schnittstelle
X33.5	TXD	Ausgang	Rückwand	RS232-Pegel	Serielle Schnittstelle
X33.4,7	RTS	Ausgang	Rückwand	RS232-Pegel	Serielle Schnittstelle
X33.9					Masse digital
X34.1	DIO-1	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.3	DIO-2	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.5	DIO-3	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.7	DIO-4	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.2	DIO-5	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.4	DIO-6	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.6	DIO-7	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.8	DIO-8	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.9	EOI	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.10	REN	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.11	DAV	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.13	NRFD	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.15	NDAC	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.17	IFC	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.19	SRQ	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.21	ATN	bidir.	Rückwand	TTL O.C.	IEC-Bus
X34.12, 14 16,18,2 0,22,24					Masse analog
X35.2,4 6,8	VA15-P	Eingang	DREHGEBER	14.7V...15.9V max. 650mA	Versorgungsspannung analog
X35.18	+5V	Eingang	DREHGEBER	5.1V...5.3V max.20mA	Versorgungsspannung digital
X35.1,2 0,21,23 ,25					Masse
X35.16	LAMPOFF	Eingang	DREHGEBER	HCMOS-Pegel	Steuerung Beleuchtung
X35.3	POT1	bidir.	DREHGEBER		Anschl.1 d. Kontrastreglers
X35.5	POT2	bidir.	DREHGEBER		Anschl.2 d. Kontrastreglers
X35.7	POT3	bidir.	DREHGEBER		Anschl.3 d. Kontrastreglers
X35.10	POT4	bidir.	DREHGEBER		Anschl.1 d. Helligkeitsreglers
X35.12	POT5	bidir.	DREHGEBER		Anschl.2 d. Helligkeitsreglers
X35.14	POT6	bidir.	DREHGEBER		Anschl.3 d. Helligkeitsreglers
X35.9	KNOB1	Eingang	DREHGEBER	HCMOS-Pegel	Anschl.1 d. Drehgebers
X35.11	KNOB2	Eingang	DREHGEBER	HCMOS-Pegel	Anschl.2 d. Drehgeber
X35.22	LCD-D0	Ausgang	DREHGEBER	HCMOS-Pegel	Daten LCD
X35.24	LCD-D1	Ausgang	DREHGEBER	HCMOS-Pegel	Daten LCD
X35.26	LCD-D2	Ausgang	DREHGEBER	HCMOS-Pegel	Daten LCD
X35.13	LCD-D3	Ausgang	DREHGEBER	HCMOS-Pegel	Daten LCD
X35.17	LCD-CP1	Ausgang	DREHGEBER	HCMOS-Pegel	Clock1 LCD
X35.19	LCD-CP2	Ausgang	DREHGEBER	HCMOS-Pegel	Clock2 LCD
X35.15	LCD-CS	Ausgang	DREHGEBER	HCMOS-Pegel	Chip-Select LCD

7.6.2 Schnittstelle Drehgeber

Pin	Name	Ein/Ausgang	Herkunft/Ziel	Wertebereich	Signalbeschreibung
X5.2,4 X5.6,8	+15V	Eingang	RECHNER	14.7V...15.9V max. 600mA	Versorgungsspannung analog
X5.18	+5V	Eingang	RECHNER	5.1V..5.3V max.20mA	Versorgungsspannung digital
X5.1,20 21,23,25					Masse
X6.4	V-DC/AC	Ausgang	DC/AC-Wandler	6V...10V max. 550mA	Versorgungsspannung Beleuchtung
X6.1	GND-DC/AC		DC/AC-Wandler		
X10.1	VEE-LCD	Ausgang	LCD	-15V...-22V max. 20mA	Kontrastspannung
X10.2	VDD-LCD	Ausgang	LCD	5.1V...5.3V max. 20mA	Versorgungsspannung digital
X7.6	VSS-LCD				Masse
X5.22 X7.4	LCD-D0	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Daten LCD
X5.24 X7.3	LCD-D1	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Daten LCD
X5.26 X7.2	LCD-D2	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Daten LCD
X5.13 X7.1	LCD-D3	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Daten LCD
X5.15 X7.10	LCD-CS	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Chip-Select LCD
X5.17 X7.8	LCD-CP1	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Clock1 LCD
X5.19 X7.9	LCD-CP2	Eingang Ausgang	RECHNER LCD	HCMOS-Pegel	Clock2 LCD
X5.16	LAMPOFF	Eingang	RECHNER	HCMOS-Pegel	Steuerung Beleuchtung
X5.9	KNOB1	Ausgang	RECHNER	O.C. 2,2kOhm	Anschl.1 d. Drehgebers
X5.11	KNOB2	Ausgang	RECHNER	O.C. 2,2kOhm	Anschl.2 d. Drehgebers
X5.3,5,7	POT1,2,3	bidir.	RECHNER		Anschl.1,2,3 d. Kontrastreglers
X5.10,12,14	POT4,5,6	bidir.	RECHNER		Anschl.1,2,3 d. Helligk.reglers

7.6.3 Schnittstelle LCD

Pin	Name	Ein/Ausgang	Herkunft/Ziel	Wertebereich	Signalbeschreibung
CONN2.5	VEE-LCD	Eingang	DREHGEBER	-15V...-22V	Kontrastspannung
CONN2.7	VDD-LCD	Eingang	DREHGEBER	5.1V...5.3V	Versorgungsspannung digital
CONN1.6	VSS-LCD				Masse
CONN1.4	LCD-D0	Eingang	DREHGEBER	HCMOS-Pegel	Daten LCD
CONN1.3	LCD-D1	Eingang	DREHGEBER	HCMOS-Pegel	Daten LCD
CONN1.2	LCD-D2	Eingang	DREHGEBER	HCMOS-Pegel	Daten LCD
CONN1.1	LCD-D3	Eingang	DREHGEBER	HCMOS-Pegel	Daten LCD
CONN1.10	LCD-CS	Eingang	DREHGEBER	HCMOS-Pegel	Chip-Select LCD
CONN1.8	LCD-CP1	Eingang	DREHGEBER	HCMOS-Pegel	Clock1 LCD
CONN1.9	LCD-CP2	Eingang	DREHGEBER	HCMOS-Pegel	Clock2 LCD

ROHDE&SCHWARZ

SERVICE INSTRUCTIONS

Front Module with Controller VAR 08

1035.5440

Variation Declaration of the entire Module:

1035.5440.02 SMP

1035.5440.03 SME

1035.5440.04 SMT

1035.5440.05 SMIQ

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PART LIST
COORDINATES LIST
CIRCUIT DIAGRAM
LAYOUT DIAGRAM

7. Testing and Repair of the Board

Caution ! ! In the Front Module many data are stored, which are necessary for operation. All data contained in the RAM may be reconstructed by the unit itself. To reconstruct data in the flash EPROM additional tools are necessary. If there is some danger to loose data of the flash EPROM, be shure, you can

1) load a new firmware,

2) perform a level calibration (refer to section 6.4 of service manual),

3) restore calibration data or calibrate the Reference Oscillator (refer to section 2.11.8 of operating manual),

4) reconstruct the operational data in the menue UTILITIES/DIAG/PARAM.

To do 3) and 4) the concerned data have to be noted down before work on the module. To restore data of reference oscillator, you got to unlock password protection level 2 (refer to section 2.11.7 of operating manual). The password is 250751. After this in the menue UTILITIES/CALIB/REF OSC the noted calibration data can be keyed in. To construct operational data (4), password protection level 3 is to be unlocked. Please contact your R&S representative to get the password. The menue UTILITIES/DIAG/SET PARAM will appear and allow to key in the noted data.

7.1 Function Description

The front module contains the following components: controller, shaft encoder, keyboard and LC display.
The controller must provide the following functions and features:

- CPU: 80960
- RAM with battery-backup
- 512K-Byte RAM with battery-backup
- Battery test
- Firmware in flash-EPROMs which can be updated
- IEEE-bus interface
- SERBUS interface
- RS232 / V.24 interface
- Timers
- Interrupt controller
  all interrupts maskable either at the source or at the interrupt controller
- ACFAIL of the power supply triggers maskable interrupt
- Processing of external trigger signals
  (TRIGGER, AUX-TRIG) polarity selectable
- LCD interface
- brightness and contrast control for LCD
- spinwheel interface
- connector for keyboard matrix
- self diagnostics with 12-bit converter and
  two diagnostic inputs (±5V & ±15V)
- X-output (0 to 10 V)
- identification of model/variation

- various control lines for other modules
  (MODCTRL-OUT, MODCTRL-IN)
- digital output and input signals
  (BLANK, MARKER, SWEEP-STOP, KEYBEEP)
- SYS-RESET by the power supply causes system reset
- standby switch and standby LED

7.1.1 CPU: 80960

Due to internal doubling, the processor 80960HD50 (clock rate: 50 MHz) requires a 25-MHz clock signal. This signal is derived from a 50-MHz oscillator by means of a divider. This divider is used like an ASIC (CLKGEN D3) providing several of the clock frequencies used in the system.
As the bus interface of the 80960 is designed for burst access, several CPLDs are used (D300, D402, D950). They serve to control access and access speed of the individual components and to generate the READY signal.

The data-bus drivers D5 and the address drivers D220 to D222 isolate the "periphery bus" from the "memory bus".

7.1.2 512K-Byte RAM with Battery-backup

This memory is composed of four 512kbit SRAM components (D17 to D20). The access to this memory is disabled by the signal RES-P, wobei in den Low-Power-Mode umgeschaltet wird.

7.1.3 Battery Test

The charge of the battery can be tested by connecting a load resistor of 39,2 kOhm to the battery by means of the REED relay, which is controlled by the signal TST-BATT. The voltage at the resistor is applied to the self-diagnostics circuit and thus informs on the discharge degree of the battery.

7.1.4 FLASH-EPROMs (Firmware Update)

The use of FLASH-EPROMs allows for making firmware updates without external access. Four components D1,D2,D11, and D21 of type 28F016 (4M-words), are therefore provided.
The voltage VPP required for programming is generated from +15V by the component D400. This linear controller can be switched on and off by means of the signal VPP-ON.
The firmware update is realized via an RS232 interface at the rear panel of the instrument.
The initial program loader is contained in the BOOT-EPROM (D301). This BOOT-EPROM additionally allows for fitting the FLASH-EPROMs as unprogrammed standard components.

7.1.5 IEEE-Bus Interface

The component TNT4882C (D60) is used as IEEE-bus controller. The complete controller capability of the IEEE-bus can be realized. It is provided with an 40MHz clock frequency via a separate quartz oscillator.

7.1.6 SERBUS-Interface

A serial bus system (SERBUS) developped by R&S is used for control and programming of the individual modules. Two standard ASICs are already available (SERBUS–M and SERBUS–D).
The controller accomodates the bus-master component (SERBUS–M / D87). It is programmed in words and operated at a clock frequency of 20 MHz. 4 MHz are used for serial data transmission to the boards.

7.1.7 RS232- / V.24-Interface

This interface is implemented by controller IC 16C550 (D85). Level conversion from TTL to RS232 is carried out in component LT1181 (D860).

7.1.8 Timer

The component uPD71054 (D61) contains three 16-bit timers. Two of them (timers 1 and 2) are cascaded to achieve a high resolution for long periods of time. The input clock is 1 kHz for timer 0 and 1 MHz for timers 1 and 2.

7.1.9 Interrupt Controller

The interrupt controller used is integrated in the CPU80960. The dynamic interrupt sources are connected directly. The static ones are merged via gate D827 and applied to the Int input XINT7 of the CPU. They can be masked separately and read out via the bus.

7.1.10 ACFAIL, SYSRESET

The signal ACFAIL is generated in the power supply and belongs to those interrupt signals which are not maskable at the source. Masking is carried out as described under 7.1.9. SYSRESET (generated by the power supply, too) is applied to the reset component MAX793 (D15) via D106 and initiates the reset. Simultaneously, the capacitor C55 is discharged via R264 and V4. When the signal SYSRESET assumes HIGH level again, C55 charges via R265 and, subsequent to reaching the threshold voltage of D106, enables the reset input again.

7.1.11 Processing of External Trigger Signals

(TRIGGER, AUX-TRIG) polarity is selectable

The polarity of the trigger signal can be set individually for both trigger signals at port D810 and is generated by an EXOR logic combining the port signal and the trigger signal(D840).

7.1.12 LCD Interface

The LCD controller SED1351F (D90) of SEIKO EPSON is used to address the LC display. The display buffer/video RAM consists of the two SRAMs D960 and D970 and offers memory space for four screen pages (640 x 200).
Linear addressing of the pixels (pixel 0 is LSB of the lowest address) is achieved by mirroring the data bus at D90 byte by byte.
The data and clock signals for the LCD are routed via D980 to increase the driver capability and to isolate the component D90.

7.1.13 Brightness and Contrast Control for LCD

PC board: Shaft Encoder (1035.5592.01)
Brightness is set via the input voltage of the DC/AC converter for the CFL illumination. The input voltage for this converter may vary between +6V and +10V. Increase of voltage means increase of brightness. The voltage is controlled by means of LM317T (N50), and the output voltage is set using R990.
The input voltage of the converter must assume +10V with switch-on of the instrument in order to ensure ignition of the fluorescent tubes. The circuit consisting of N51 and V52. which shortly provides +10V following switch-on, is available for this purpose. The illumination can be switched off by means of V48 to improve the interference radiation of the AC/DC converter and of the fluorescent tubes.
The contrast is set via the negative supply voltage VEE of the LC display. This voltage is derived from +15V by means of a switch-capacitor-voltage-converter with controller (LT1054/N70) and can be set in the range from -15V to -22V using R995.

Two additional pi-type LC filters are contained on the board for filtering of the interferences radiated by the DC/AC converter and the converter LT1054.

7.1.14 Knob Interface

With each change of level of the signal KNOB2 (CLK), a LOW pulse is generated via the runtime chain consisting of D566C/D and D562B/C at the EXNOR-gate D566B. This pulse is used to store the direction information in the flip-flop D565B and to trigger an interrupt using D565A.

7.1.15 Connector for the Keyboard Matrix

The vertical lines are connected to the register D550, the horizontal lines to the port D560.
If no key is pressed the connected horizontal lines are applied to HIGH potential via the pull-up resistors R90 to R96. The vertical lines are kept at LOW potential by the register outputs. As soon as a key is pressed, the associate horizontal line assumes LOW potential. Subsequent to debouncing, an interrupt is generated, which allows for applying the vertical lines individually to LOW potential. The level indicates, which key was pressed.

7.1.16 Diagnostics A/D Converter

including 12-bit converter and two diagnostic inputs (±5V & ±15V)

The two diagnostic inputs and a few test points of the controller are applied to the A/D converter D704 via the multiplexer D700, the impedance converter N701 and the input amplifier.
The following voltages can be set for maximum range of the A/D converter: +-15V, +-5V and +-1V.
The conversion time (max. 9 us) is indicated by the BUSY output, which can be read in via D570 (port1).
The following voltages can be measured using the self-diagnostics converter for self-diagnostic purposes:

- the voltage at the X-output
- the reference voltage of the D/A converter
- the battery voltage

Moreover, test cables can be connected instead of the shorting jumper X700 and thus, any test point can be connected to the A/D converter. Make sure, that the test voltage does not exceed +-15V.

7.1.17 X-Output

With sweeping, the X-output generates an output signal of 0V (sweep start) to 10V (end of sweep), which can be used to control external devices. This signal is generated by the processor by setting the D/A converter D706 correspondingly, depending on the sweep. The resistor R223 and the diodes V10 are provided for overvoltage protection.

7.1.18 Identification of Variant and Revision

The port D4 is provided for identification of the module. The variant of the module is coded by the configuration of the resistors R592 to R594, the revision by R595 through R598.

7.1.19 Control Signals, Key Beep

The signals MODCNTL-OUT and MODCNTL-IN allow for synchronization between the signal processor of the modulation generator module and the processor.
The output signals BLANK and MARKER as well as the input signal SWEEP-STOP are used for control and synchronization of external devices.
The output port D213 supplies the control signal (LAMP-OFF) for switching off the tubular fluorescent lamps.
The piezo-buzzer U1 is provided for generation of a key beep.

7.1.20 Standby Switch and LED

The standby switch fitted to the front panel of the generator is connected directly to the controller and routed to the motherboard via the common ribbon cable.
The standby LED is switched between +15V and VS12-P such that in case of a cut of +15V a current may flow from VS12-P via the LED to the virtual ground of the +15V.

7.2 Test Instruments and Utilities

Oscilloscope	100MHz	e.g., BOL
DC multimeter	0 to +-30V, Ri>1MOhm	e.g., UDL33
DC voltage source	..10V	e.g., NGT20

7.3 Troubleshooting

Standby LED does not light up	Check the standby voltage at X312.5
Subsequent to switch-on, the LC-Display remains dark	Check the voltage of the DC/AC converter acc.to 7.4.1
Setting of contrast not possible	Check the contrast voltage acc. to 7.4.2
Shaft encoder does not work	Check the pulses of the shaft encoder acc. to 7.4.3
No display following switch-on	Check the RESET signal acc. to 7.4.4
	Check the ACFAIL signal acc. to 7.4.4
No voltage at X-AXIS	Check the output X-AXIS using diagnostics acc. to 7.4.6
	Check the reference voltage using the diagnostics acc. to 7.4.6
No storage of data after switching off the instrument	Check the RAM voltage using diagnostics acc. to 7.4.6

7.4 Testing and Adjustment

7.4.1 Checking the Supply Voltage of the DC/AC Converter

Shaft encoder module:
Measure the DC voltage at the connector X6.4 depending on the position of the brightness control at the front panel of the instrument: rated value: 6V to 10V.

7.4.2 Checking the Contrast Voltage

SHAFT ENCODER module:
Measure the DC voltage at the connectors X7.5 and X10.5 depending on the position of the contrast controller at the front panel of the instrument: rated value: -15V to -22V.

7.4.3 Checking the Shaft Encoder

CONTROLLER module:
Connect an oscilloscope to X35.9 and X35.11.
Turn the shaft encoder. There must be 2 signals with different timing.

7.4.4 Testing the RESET and the ACFAIL Signal

CONTROLLER module:
Connect an oscilloscope to X31.35 and D15 PIN15.
Just upon switching on the instrument, the level of the ACFAIL signal must change from L to H. This change of level must be indicated by the RESET signal (RES-N) after approx. 200 to 300 ms. Both signals must remain HIGH-level with all operating states.

7.4.5 Checking the Diagnostic Path

- Settings: **TPOINT 4**
- Apply a DC voltage of 0.5V to X700.
- Check the voltage at P710: 0.5V and P730: 1.5V.

7.4.6 Check and Readout of the Diagnostic Test Points

TPOINT	Voltage	Meaning
0	0mV to 50mV	Reference point
1	-15V to 15V	DIAG -15V
2	-15V to 15V	DIAG -5V
3	0V to 10V	X-AXIS
4	-15V to 15V	Voltmeter
6	4.9V to 5.1V	Reference voltage X-D/A
7	3.2V to 4.0V	Battery voltage

7.4.7 Checking the Position of Jumpers

Jumper	Position	Remark
X105	1 - 2	Clock (periphery)
X106	1 - 2	Clock (CPU)
X111	2 - 3	addr. flash
X112	2 - 3	addr. eprom
X300	1 - 2	Battery
X2	1 - 2	+5V-voltage
X85	1 - 2	Voltmeter
X3	2 - 3	Timer-Int
X700	1 - 2	Clock (RS232)

7.5 Removal and Assembly

Remove the 4 screws at the front panel of the instrument. Carefully swing out the module to the front, in order to be able to disconnect the cable connections W20, W313 and W314. Subsequent to disconnecting W31 (ribbon cable to the motherboard), the front module can be withdrawn. The metal cover on the rear is fixed by 6 screws. The CONTROLLER board can be removed carefully after unlocking the sockets X316, X317 and separating the two foils as well as the socket at X312. Finally, disconnect the ribbon cable W315 to the ENCODER board.

Removal of the p.c.b. SHAFT ENCODER: remove the rotary knob, and disconnect the connection at X6 (to. DC/AC converter) and X7 (ribbon cable to LCD). Disconnect 12-pin connector support of the cable W10 from the LCD. The p.c.b. can be removed after unscrewing of 4 screws.

Removal of the LCD: disconnect the cable W10 as well as the flat foil to the PCB SHAFT ENCODER from X7. Disconnect the 4-pin connector between the DC/AC converter and the CFL illumination. The LCD is fixed to the cast housing by 4 screws and can be taken out completely.

Assembly has to be carried out in the reverse order. Prior to fixing the cover again, make sure that the PROCESSOR board has locked in place correctly and that the seal cord is correctly applied.

7.6 External Interfaces

7.6.1 Controller Interface

Pin	Name	Input/Output	Origin/Destin.	Specified range	Signal description
X31.1 to 6	VD-5P	Input	A2, POWS	5.10V to 5.25V max. 3000mA	Supply voltage, digital
X31.11 to 12	VA15-P	Input	A2, POWS	14.7V to 15.9V max. 660mA	Supply voltage, analog
X31.15	VA15-N	Input	A2, POWS	-15.9V to-14.7V max. 50mA	Supply voltage, analog
X31.27	VS12-P	Input	A2, POWS	11.6V to 12.4V	Standby-voltage
X31.7,8 9,10,13 14,16					Ground, digital
X31.19, 20					Ground, analog
X31.26 X312.2	POWER-SWITCH	Output	A2, POWS		Switch contact
X31.25 X312.1	POWER-SWITCH-GND	Output	A2, POWS		Switch contact
X312.5	STBY-LED1	Output	A2, POWS		Anode of standby-LED
X312.3	STBY-LED2	Input	A2, POWS		Cathode of standby-LED
X312.4	N.C.				Coding
X31.40	SERBUS-CLK	Output		HCMOS level	Serbus Clock
X31.39	SERBUS-DAT	bidir.		HCMOS level	Serbus data
X31.37	SERBUS-SYNC	Output		HCMOS level	Serbus synchronization
X31.38	SERBUS-INT	Input		HCMOS level	Serbus interrupt
X31.28	RES-P	Output		HCMOS level	Reset
X31.44	DIAG-5V	Input		-5V to 5V	Diagnostics
X31.43	DIAG-15V	Input		-15V to 15V	Diagnostics
X31.42	TRIGGER	Input	Rear panel	HCMOS level	Trigger
X31.41	AUX-TRIG	Input	Rear panel	HCMOS level	Trigger
X31.36	SYSRESET	Input	A2, POWS	HCMOS level	System reset
X31.35	ACFAIL	Input	A2, POWS	HCMOS level	Power fail
X31.34	BLANK	Output	Rear panel	HCMOS level	Control signal
X31.33	MARKER	Output	Rear panel	HCMOS level	Control signal
X31.32	SWEEP-STOP	Input	Rear panel	HCMOS level	Control signal
X31.30	MODCTRL-OUT	Output	A5, MGEN X5.2	HCMOS level	Modulation generator control
X31.31	MODCTRL-IN	Input	A5, MGEN X5.1	HCMOS level	Modulation generator control
X31.45	X-AXIS	Output	Rear panel	0 to 10V	Frequ.-prop. voltage
X31.47	DONE	Input		HCMOS level	Interrupt signal
X31.17, 18, 21 to 24	INP00 to INP05	Input		HCMOS level	
X31.46	UBEXT	Input		0 to 5 V	Ext. battery connector
X37.1 to 7	RET0 to RET6	Input	Shaft encoder	HCMOS level	Keyboard

X37.8 to 13	SCAN0 to SCAN5	Output	Shaft encoder	HCMOS level	Keyboard
X36.1 to 13	"GND"			1kOhm Pulldown	Keyboard
X33.6	CTS	Input	Rear panel	RS232 level	Serial interface
X33.3	RXD	Input	Rear panel	RS232 level	Serial interface
X33.5	TXD	Output	Rear panel	RS232 level	Serial interface
X33.4,7	RTs	Output	Rear panel	RS232 level	Serial interface
X33.9					Ground, digital

Pin	Name	Input/Output	Origin/Destin.	Specified range	Signal description
X34.1	DIO-1	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.3	DIO-2	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.5	DIO-3	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.7	DIO-4	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.2	DIO-5	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.4	DIO-6	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.6	DIO-7	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.8	DIO-8	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.9	EOI	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.10	REN	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.11	DAV	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.13	NRFD	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.15	NDAC	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.17	IFC	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.19	SRQ	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.21	ATN	bidir.	Rear panel	TTL O.C.	IEEE bus
X34.12 14,16, 18,20, 22,24					Ground
X35.2, 4,6,8	VA15-P	Input	SHAFT ENCODER	14.7V to 15.9V max. 650mA	Supply voltage, analog
X35.18	+5V	Input	SHAFT ENCODER	5.1V...5.3V max.20mA	Supply voltage, digital
X35.1, 20,21, 23,25					Ground
X35.16	LAMPOFF	Input	SHAFT ENCODER	HCMOS level	Illumination control
X35.3	POT1	bidir.	SHAFT ENCODER		Conn.1 of contrast control
X35.5	POT2	bidir.	SHAFT ENCODER		Conn.2 of contrast control
X35.7	POT3	bidir.	SHAFT ENCODER		Conn.3 of contrast control
X35.10	POT4	bidir.	SHAFT ENCODER		Conn.1 of brightness control
X35.12	POT5	bidir.	SHAFT ENCODER		Conn.2 of brightness control
X35.14	POT6	bidir.	SHAFT ENCODER		Conn.3 of brightness control
X35.9	KNOB1	Input	SHAFT ENCODER	HCMOS level	Conn.1 of the shaft encoder
X35.11	KNOB2	Input	SHAFT ENCODER	HCMOS level	Conn.2 of the shaft encoder
X35.22	LCD-D0	Output	SHAFT ENCODER	HCMOS level	Data LCD
X35.24	LCD-D1	Output	SHAFT ENCODER	HCMOS level	Data LCD
X35.26	LCD-D2	Output	SHAFT ENCODER	HCMOS level	Data LCD
X35.13	LCD-D3	Output	SHAFT ENCODER	HCMOS level	Data LCD
X35.17	LCD-CP1	Output	SHAFT ENCODER	HCMOS level	Clock1 LCD
X35.19	LCD-CP2	Output	SHAFT ENCODER	HCMOS level	Clock2 LCD
X35.15	LCD-CS	Output	SHAFT ENCODER	HCMOS level	Chip-Select LCD

7.6.2 Shaft encoder Interface

Pin	Name	Input/Output	Origin/Destination	Specified range	Signal description
X5.2,6,8	+15V	Input	Controller	14.7V to 15.9V max.600mA	Supply voltage, analog
X5A.18	+5V	Input	CONTROLLER	5.1V..5.3V max.20mA	Supply voltage, digital
X5.1 ,20,21, 23,25					Ground
X6.4	V-DC/AC	Output	DC/AC converter	6V...10V max. 550mA	Supply voltage for illumination
X6.1	GND-DC/AC		DC/AC-converter		
X10.1	VEE-LCD	Output	LCD	-15V to -22V max. 20mA	Contrast voltage
X10.2	VDD-LCD	Output	LCD	5.1V to 5.3V max. 20mA	Supply voltage, digital
X7.6	VSS-LCD				Ground
X5.22 X7.4	LCD-D0	Input Output	CONTROLLER LCD	HCMOS level	Data LCD
X5.24 X7.3	LCD-D1	Input Output	CONTROLLER LCD	HCMOS level	Data LCD
X5.26 X7.2	LCD-D2	Input Output	CONTROLLER LCD	HCMOS level	Data LCD
X5.13 X7.1	LCD-D3	Input Output	CONTROLLER LCD	HCMOS level	Data LCD
X5.15 X7.10	LCD-CS	Input Output	CONTROLLER LCD	HCMOS level	Chip-Select LCD
X5.17 X7.8	LCD-CP1	Input Output	CONTROLLER LCD	HCMOS level	Clock1 LCD
X5.19 X7.9	LCD-CP2	Input Output	CONTROLLER LCD	HCMOS level	Clock2 LCD
X5.16	LAMPOFF	Input	CONTROLLER	HCMOS level	Illumination control of
X5.9	KNOB1	Output	CONTROLLER	O.C. 2,2kOhm	Conn.1 of the shaft encoder
X5.11	KNOB2	Output	CONTROLLER	O.C. 2,2kOhm	Conn.2 of the shaft encoder
X5.3,5,7	POT1,2,3	bidir.	CONTROLLER		Conn.1,2,3 of contrast contr.
X5.10, 12, 14	POT4,5,6	bidir.	CONTROLLER		Conn.1,2,3 of brightnes control

7.6.3 LCD Interface

Pin	Name	Input/Output	Origin/Destin.	Specified range	Signal description
CONN2.5	VEE-LCD	Input	SHAFT ENCODER	-15V to -22V	Contrast voltage
CONN2.7	VDD-LCD	Input	SHAFT ENCODER	5.1V to 5.3V	Supply voltage digital
CONN1.6	VSS-LCD				Ground
CONN1.4	LCD-D0	Input	SHAFT ENCODER	HCMOS level	Data LCD
CONN1.3	LCD-D1	Input	SHAFT ENCODER	HCMOS level	Data LCD
CONN1.2	LCD-D2	Input	SHAFT ENCODER	HCMOS level	Data LCD
CONN1.1	LCD-D3	Input	SHAFT ENCODER	HCMOS level	Data LCD
CONN1.10	LCD-CS	Input	SHAFT ENCODER	HCMOS level	Chip-Select LCD
CONN1.8	LCD-CP1	Input	SHAFT ENCODER	HCMOS level	Clock1 LCD
CONN1.9	LCD-CP2	Input	SHAFT ENCODER	HCMOS level	Clock2 LCD

ROHDE&SCHWARZ

Schaltteillisten
numerisch geordnet

Part lists
in numerical order

Listes des pièces détachées
par numéros de référence

095.1000 Bl. 3

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
A31	ED RECHNER PROCESSOR BOARD NUR VAR/ONLY MOD: 02 04	1035.7250.04			
A31	ED RECHNER PROCESSOR BOARD NUR VAR/ONLY MOD: 03	1035.7766.06			
A31	ED RECHNER ABFS(FC) PROCESSOR BOARD ABFS (FC) NUR VAR/ONLY MOD: 05 13 15 16	1084.8804.10			
A34	BV E1256 DC/AC-WANDLER DC/AC-CONVERTER	0840.5698.00	ERG	0840.5698	
A35	ED DREHGEBER SYNCHRO GENERATOR	1035.5592.02			
A36	SB SCHALTFOLIE F.34TASTEN KEY PAD	1036.4354.00	HOF_KRIPPN	1036.4354	
C100	CE 22UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7533.00	BEYSCHLAG	2222 116 71229	
C101	CE 22UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7533.00	BEYSCHLAG	2222 116 71229	
H2	AF HLMP1719 LED3 GE585N LED	AF 0099.9140.00	QUALITY	HLMP-1719.L31S	1035.5486.00
P1	BP DMF50161NFUFW FSTN S/W DISPLAY WITH ILLUMINATION	0008.9094.00	OPTREX	DMF50161NFU-FW	
W10	DY KABEL W10	1035.5686.00			
W11	DF FLEX-STRIPVERB.10P FLEX-STRIP	1035.5634.00			F
W11	DF FLEX-STRIPVERB.10P. FLEX-STRIP	1036.4625.00	SUMITUMO	SMCD-10X170-ADX10-P1	1035.5634.00
X2	SB NETZSCHALTER 2XU O.KN. POWER SWITCH	SB 0007.5143.00	ITT-SEL	NE18 2U E E	1035.5486.00

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C11	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C12	CE 10UF+-20%50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7427.00	PHILIPS_CO	2222 116 11109	
C13	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C50 ..53	CE 470UF+-20%25V12,5X12,5 ELECTROLYTIC CAPACITOR	0803.0715.00	NAT_PANASO	ECA-1EM471	
C54 ..58	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C59	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C60	CE 22UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7533.00	BEYSCHLAG	2222 116 71229	
C61	CE 47UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7479.00	PANASONIC	ECA-1HFG470I	
C70	CE 100UF +-20% 25V RM2.5 ELECTROLYTIC CAPACITOR	CE 0008.7891.00	PANASONIC	ECA-1EFG101I	
C71	CE 10UF+-20%50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7427.00	PHILIPS_CO	2222 116 11109	
C72	CE 10UF+-20%50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7427.00	PHILIPS_CO	2222 116 11109	
C73	CE 47UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7479.00	PANASONIC	ECA-1HFG470I	
C74	CE 47UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7479.00	PANASONIC	ECA-1HFG470I	
C75	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C76	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C77	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	AVX	1206 5 C 222 KA 3	
C79	CE 10UF +-10% 25V 7343 TANTALUM SMD-CAPACITOR	CE 0007.7246.00	SPRAGUE	293D 106 X9 025 D2W	
E1	BS UGN3120U HALL-EFF.SW. HALL-EFF.SWITCH	BJ 0336.4750.00	ALLEGRO	UGN3120U	
E2	BS UGN3120U HALL-EFF.SW. HALL-EFF.SWITCH	BJ 0336.4750.00	ALLEGRO	UGN3120U	
L10	LD 4,7UH 10%1,20HM 0,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L50	LD 100UH 20% 1A 0,6500HM CHOKE	LD 0155.9446.00	FASTRON_GE	MESC-101M-00	
L51	LD 100UH 20% 1A 0,6500HM CHOKE	LD 0155.9446.00	FASTRON_GE	MESC-101M-00	
N50	BO LM317T +ADJ1A5 VREGL VOLTAGE REGULATOR	0339.4080.00	NSC	LM-317T	
N51	BO LM2903D 2XLP COMPAR DUAL	0520.7734.00	SIGNETICS	LM2903(D)	
N70	BO LT1054CS INV SCH.REGL IC SWITCHED CAP. REGULAT	1036.4519.00	LINEAR_TEC	LT1054CSW	
R1	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R2	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R48	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R49	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R50	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	ROEDERSTEI	D25	
R53	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R54	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R55	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	DRALORIC	CR 1206	
R56	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	DRALORIC	CR 1206	
R57	RG 0-OHM WIDERSTAND 1206 RESISTOR CHIP 0-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R58	RG 0-OHM WIDERSTAND 1206 RESISTOR CHIP 0-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R59	RG 243 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6010.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R60	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R61	RG 243 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5620.00	ROEDERSTEI	D25	
R72	RL 0,60W4,75 OHM+-1%TK50 METALFILMRESISTOR	RL 0099.8021.00	PHILIPS_CO	MRS 25	
R73	RG 0-OHM WIDERSTAND 1206 RESISTOR CHIP 0-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R74	RL 0,60W4,75 OHM+-1%TK50 METALFILMRESISTOR	RL 0099.8021.00	PHILIPS_CO	MRS 25	
R75	RG 432 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6062.00	PHILIPS_CO	RC02	
R76	RG 33,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5914.00	DALE	CRCW 1206G...F-T	
R77	RG 39,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5937.00	PHILIPS_CO	RC02	
R78	RG 20,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5866.00	ROEDERSTEI	D25	
S1	EM DREHIMPULSGEBER ROTARY MAGNET	EM 0336.3348.00			
V48	AK BC337-40 N 45V 500MA TRANSISTOR	AK 0815.7684.00	PHILIPS	BC337-40 GEGURTET	
V50	AE BZV55/C5V1 0.5W ZDI ZENER DIODE	AE 0006.9839.00	PHILIPS_SE	BZV55B5V1 (GEG)	
V51	AE BZV55/C4V3 0.5W ZDI ZENER DIODE	AE 0709.0168.00	PHILIPS_SE	BZV55B4V3	
V52	AK BC337-40 N 45V 500MA TRANSISTOR	AK 0815.7684.00	PHILIPS	BC337-40 GEGURTET	
V70	AG 1N4007 GL1000V 1A0 RECTIFIER	AG 0013.0310.00	ITT-SEMICO	1N4007	
V71	AG 1N4007 GL1000V 1A0 RECTIFIER	AG 0013.0310.00	ITT-SEMICO	1N4007	
V72	AG 1N4007 GL1000V 1A0 RECTIFIER	AG 0013.0310.00	ITT-SEMICO	1N4007	
V75	AK BC337-40 N 45V 500MA TRANSISTOR	AK 0815.7684.00	PHILIPS	BC337-40 GEGURTET	
X5	FP STIFTLEISTE 26P.2REIH. CONNECTOR 26P.	FP 0520.6544.00	BINDER	11-0213-00-26	
X6	FP BUCHSENLEISTE 4POL. ANGLE SOCKET CONNECTOR	FP 2007.5069.00	DUPONT CON	67232-004	
X7	FP LEITERPLATTENVERB.10P. CONNECTOR 10POL.	1051.4397.00	MOLEX	5597-10APB(NAPB)	
X10	FP STIFTL.WIN 3P.R2,54 ANGLE PIN CONNECTOR	FP 0009.7195.00			

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
.	XX VARIANTENERKLAERUNG IDENTIFICATION OF MODELS				
1	STECKLOETOESE 7,5X1,1 IHL PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	
2	STECKLOETOESE 7,5X1,1 IHL PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	
C1	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39COG***F50ZPT	
C2	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39COG***F50ZPT	
C3	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C4 ..13	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39COG***B50ZPT	
C14	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C15 ..17	CE 470UF+-20%25V12,5X12,5 ELECTROLYTIC CAPACITOR	0803.0715.00	NAT_PANASO	ECA-1EM471	
C18	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C19	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C20 ..22	CE 10UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.5605.00	PANASONIC	EEV HB 1V 100X	
C23	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C24 ..29	CE 10UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.5605.00	PANASONIC	EEV HB 1V 100X	
C30 ..43	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C45 ..48	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C50	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C51	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C52	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C53	CE 220UF 20% 10V SMD TANTALUM SMD CAPACITOR	1081.1873.00	SPRAGUE	595D227X0010R2T	
C55	CE 10UF 10% 10V 2RO 6032 TANTALUM CHIP CAPACITOR	CE 0007.7281.00	SPRAGUE	293D-106X9 016 C2W	
C56 ..62	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C63	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39COG***F50ZPT	
C64	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C65	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C69 ..97	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C99 ..112	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C113	CE 470UF+-20%25V12,5X12,5 ELECTROLYTIC CAPACITOR	0803.0715.00	NAT_PANASO	ECA-1EM471	
C114 ..117	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C118	CE 10UF+-20%16V RUND SMD SMD ELECTROLYTIC CAPACIT.	0010.7914.00	PANASONIC	EEV-HB1C100R	
C119	CC 22ONF+-10%50V X7R 1210 CERAMIC CAPACITOR CHIP	CC 0520.6850.00	AVX	1210 5C 224 KAT2A	
C120	CE 22UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.6253.00	PANASONIC	EEV HB 1V 220P	
C121	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C122 ..125	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39COG***F50ZPT	
C126 ..133	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C135 ..143	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C144 ..151	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39COG***F50ZPT	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C152	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	
C153 ..159	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C160 ..163	CC 47PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4644.00	MURATA	GRM39C0G***F50ZPT	
C164	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C165	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C166	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C167 ..170	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C171	CE 4,7UF+-10% 10V 3528 TANTALUM CHIP CAPACITOR	CE 0007.7275.00	SPRAGUE	293D 475 X9 010 B2T	
C172 ..187	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
D1	BC E28F016XS-15 FLASH FILE MEMORY	BC 1085.2080.00	INTEL	E28F016XS15	
D2	BC E28F016XS-15 FLASH FILE MEMORY	BC 1085.2080.00	INTEL	E28F016XS15	
D3	BG L5A8666 CLKGEN ASIC GATEARRAY	BG 0008.7591.00	VLSI	CLK-GEN(R&S-NR.)	
D4	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
D5	BL 74ABT16245ADL 16X3S TX IC 16BIT BUS TRANSCEIVER	2073.8010.00	TEXAS	SN74ABT16245ADL	
D6	BL 74ACT32SC 4X OR2 IC QUAD 2-INPUT OR GATE	BL 1012.9385.00	HARRIS	CD74ACT32M	
D7	BL 74ACT20SC 2X4-IN NAND IC DUAL 4-INPUT NAND GATE	BL 0008.0700.00	HARRIS	CD74ACT20M	
D8	BL 74ACT08SC 4X AND2 IC QUAD 2-INP AND GATE	BL 1012.9362.00	HARRIS	CD74ACT08M	
D10	BC FC80960HD50	1085.2180.00	INTEL	FC80960HD50	
D11	BC E28F016XS-15 FLASH FILE MEMORY	BC 1085.2080.00	INTEL	E28F016XS15	
D13	BL 74ACT32SC 4X OR2 IC QUAD 2-INPUT OR GATE	BL 1012.9385.00	HARRIS	CD74ACT32M	
D14	BL 74ACT163SC 4B BINCTR IC MODULO-16-BIN COUNTER	BL 2032.2576.00	HARRIS	CD74ACT163M	
D15	BO MAX793TCSE UPSUPERVIS IC UP VOLTAGE SUPERVISOR	1104.2528.00	MAXIM	MAX793TCSE	
D17 ..20	BC KM684000BLG-7 SRAM CMOS STATIC RAM 512KX8	2068.9193.00	SAMSUNG	KM684000(B/C)LG-7	
D21	BC E28F016XS-15 FLASH FILE MEMORY	BC 1085.2080.00	INTEL	E28F016XS15	
D60	BC TNT4882C IEE488-CONTRL IC IEEE488 CONTROLLER	1050.0700.00	NATIONAL/I	TNT4882C(A/B)Q	
D61	BC UPD71054L10 TIMER PROGR.INTERVAL-TIMER	1051.5258.00	NEC	(UPD)71054L-10	
D71	BL 74AC02SC 4X2IN NORG QUAD NOR GATE	BL 0820.3490.00	NSC	74AC02(SC)	
D72	BL 74ACT32SC 4X OR2 IC QUAD 2-INPUT OR GATE	BL 1012.9385.00	HARRIS	CD74ACT32M	
D85	BC TL16C550AFN UART IC WART	3527.9354.00	TEXAS	TL16C550AFN	
D87	BG SERBUS-M2E ASIC IC GATEARRAY	1066.1976.00	FRAUNH_IFT	SERBUSM2E	
D90	BC SED1351F0A LCD-CTRL LCD CONTROLLER	0008.7727.00	SEIKO_EPSO	SED1351F0A	
D106	BL 74HC132T 4XSCHMITT T QUAD 2-INP NAND SCHMITT	BL 0520.7811.00	PHILIPS_SE	(PC)74HC132(D/T)	
D199	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
D200	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
D213	BL 74ACT273 8X D-FF M.RES OCTAL D FLIP-FLOP	BL 1058.0745.00	HARRIS	(CD74)ACT273(M)	
D220 ..222	BL 74FCT244ASO 8XBUFF 3S OCTAL BUFFER/LINE DRIVER	BL 0843.7240.00	IDT	IDT74FCT244ASO	
D223	BL 74FCT138CTSO1-8DECODER IC 1-OF-8 DECODER	BL 1051.5164.00	IDT	(IDT74)FCT138C(TSO)	
D224	BL 74FCT138CTSO1-8DECODER IC 1-OF-8 DECODER	BL 1051.5164.00	IDT	(IDT74)FCT138C(TSO)	
D226	BL 74ACT138SC 3TO8 DECOD 3-TO-8 DECODER/DEMUX	BL 2007.5017.00	HARRIS	CD74ACT138(M)	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
D227	BL 74ACT138SC 3TO8 DECOD 3-TO-8 DECODER/DEMUX	BL 2007.5017.00	HARRIS	CD74ACT138(M)	
D300	BC ISPLSI1016-60LT PLD ISP LOGIC DEVICE	BC 2073.8127.00	LATTICE	ISPLSI1016-60LT	
D301	HS 1084.8604-SOFTW..D301.	1084.8604.00			
D310	BL 74ACT139SC 2X 1A4DEMUX IC DUAL 1-OF-4 DEMUX	BL 2000.2412.00	HARRIS	CD74ACT139M	
D400	BO LP2951CMLOWDROP +VREGL IC VOLTAGE REGULATOR	1020.0890.00	NSC	LP2951CM	
D402	BC ISPLSI1016E-100LT44PLD ISP LOGIC DEVICE	BC 1085.1484.00	LATTICE	ISPLSI1016E-100LT44	
D550	BL 74HCT273D 8XD-FF OCTAL D-TYPE FLIPFLOP	BL 0007.6610.00	PHILIPS_SE	(PC)74HCT273(D/T)	
D560	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
D561	BL PC74HCT4075T 3X3IN ORG TRIPLE 3INPUT OR GATE	0007.6879.00	PHILIPS	(PC)74HCT4075(T)	
D562	BL PC74HCT4075T 3X3IN ORG TRIPLE 3INPUT OR GATE	0007.6879.00	PHILIPS	(PC)74HCT4075(T)	
D563	BL 74HCT74T 2XD-FLIPFL DUAL D-TYPE FLIP FLOP	BL 0007.6262.00	PHILIPS_SE	(PC)74HCT74D(T)	
D565	BL 74ACT74M 2XRSFLIPFLOP DUAL D-TYPE FLIP FLOP	BL 0008.0680.00	TEXAS_INST	(SN/CD)74ACT74D	
D566	BL PC74HC7266T4X2IN EXNOR QUAD 2INPUT EXNOR GATE	0729.4630.00	PHILIPS	(PC)74HC7266(T())	
D567	BL 74HC14T 6XINV.SCHM HEXINV.SCHMITT-TRIGGER	BL 0007.4018.00	PHILIPS_SE	(PC)74HC14(D/T)	
D568	BL 74HC14T 6XINV.SCHM HEXINV.SCHMITT-TRIGGER	BL 0007.4018.00	PHILIPS_SE	(PC)74HC14(D/T)	
D569	BL PC74HCT123T 2XMONOFLOP DUAL MULTIVIBRATOR	BL 0007.6333.00	PHILIPS_SE	(PC)74HCT123(D/T)	
D570	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
D621	BL 74HCT02T 4X NOR2 QUAD 2INPUT NORGATE	BL 0007.5366.00	PHILIPS_SE	(PC)74HCT02(D/T)	
D700	BS DG408DY 8CH.ANAL.MUX IC 8 CH ANALOG MULTIPLEX	1036.4460.00	SILICONIX	DG408DY	
D701	BS DG441DY 4X ANALOGSCH QUAD ANALOG SWITCH	1036.4454.00	SILICONIX	DG441DY	
D702	BL 74ACT20SC 2X4-IN NAND IC DUAL 4-INPUT NAND GATE	BL 0008.0700.00	HARRIS	CD74ACT20M	
D703	BL 74HCT273D 8XD-FF OCTAL D-TYPE FLIPFLOP	BL 0007.6610.00	PHILIPS_SE	(PC)74HCT273(D/T)	
D704	BJ AD7870KP 1X12B-ADC ANALOG DIGITAL CONVERTER	1036.4402.00	ANALOG_DEV	AD7870KP	
D706	BJ AD7245JP 1X12B-DAC DIGITAL/ANALOG CONVERTER	1036.4419.00	ANALOG_DEV	AD7245JP	
D810	BL 74HCT273D 8XD-FF OCTAL D-TYPE FLIPFLOP	BL 0007.6610.00	PHILIPS_SE	(PC)74HCT273(D/T)	
D811	BL 74HCT273D 8XD-FF OCTAL D-TYPE FLIPFLOP	BL 0007.6610.00	PHILIPS_SE	(PC)74HCT273(D/T)	
D812	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
D820	BL 74HCT32T 4X OR2 QUAD 2INPUT OR GATE	BL 0007.5389.00	PHILIPS_SE	(PC)74HCT32(D/T)	
D826	BL 74HCT32T 4X OR2 QUAD 2INPUT OR GATE	BL 0007.5389.00	PHILIPS_SE	(PC)74HCT32(D/T)	
D827	BL PC74HCT11T 3X3IN ANDG AND GATE	BL 0007.6191.00	PHILIPS_SE	(PC)74HCT11(D/T)	
D840	BL 74HCT86T 4X EXOR2 EXOR GATE	0007.6291.00	PHILIPS_SE	(PC)74HCT86(D/T)	
D860	BJ LT1181ACS RS232 2TX2RX RS-232 TRANSCEIVER	1008.2915.00	LINEAR_TEC	LT1181ACSW	
D950	BC ISPLSI1016-60LT PLD ISP LOGIC DEVICE	BC 2073.8127.00	LATTICE	ISPLSI1016-60LT	
D960	BC 84256-12LP 32KX8 SRAM SRAM	BC 0007.6985.00	INTEGRATED	IS62C256-70U	
D970	BC 84256-12LP 32KX8 SRAM SRAM	BC 0007.6985.00	INTEGRATED	IS62C256-70U	
D980	BL PC74HCT541T 8XBUSDRIV OCTAL BUFFER/LINE DRIVER	BL 1006.4104.00	PHILIPS_SE	(PC)74HCT541(D/T)	
G3	EO 3,6864MHZ QUARZOSZ QUARTZ CRYSTAL OSZILLATOR	1097.6540.00	SEIKO	SG-615P	
G40	EO 40,000MHZ QUARZOSZ QUARTZ CRYSTAL OSCILLATOR	1078.3133.00	SEIKO	SG 615 PH	
G50	EO 50,000MHZ QUARZOSZ QUARTZ CRYSTAL OSCILLATOR	1029.2995.00	SEIKO	SG-615PH-C	

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1GPK 062 3PLU	Al	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr. Page
ROHDE&SCHWARZ	10	05.07.00	ED RECHNER (FC) FAST CPU	**1084.8504.01 SA**	3+

095.0026-0693

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
G300	EB 3,4V LITHIUM-BATTERIE LI BATTERY	0565.1687.00	ACCU_SONNE	SL-750/P/009 1110750	
K1	SN RELAIS 5V 1XU MONOST. RELAY	SN 1078.3256.00	SIEMENS	V23026-D1021-B201	
L1 ..3	LD SMD-DR.Z=625 OHM 50MHZ CHOKE	1078.3240.00	PHILIPS_CO	4330 030 41663	
L4	LD SP-DROSSEL 15UH 2,45A CHOKE	1081.0283.00	SUMIDA	CDR125-150	
L5	LD SP-DROSSEL 15UH 2,45A CHOKE	1081.0283.00	SUMIDA	CDR125-150	
N1	BO 79L05ACM-5V5%OA1VREGL VOLTAGE REGULATOR 5VDC	0851.6703.00	NSC	LM79L05ACM(X)	
N2	BO LM2596S-ADJ SCH.REGL IC SWITCHING REGULATOR	1085.2097.00	NSC	LM2596S-ADJ	
N700	BO OP97FS LP PREC OPAMP LOW POWER OPAMP	1036.4390.00	PMI	OP97F(S)	
N701	BO OP97FS LP PREC OPAMP LOW POWER OPAMP	1036.4390.00	PMI	OP97F(S)	
N702	BO OP07CS8 OPAMP OPERATIONAL AMPLIFIER	0007.7781.00	LINEAR_TEC	LT1001(CS8)	
P1	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P2	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P3	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P4	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P5	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P6	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P7 ..18	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P21	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P22	VL LOETOESE 6,9 X 0,9 SOLDERING PIN	VL 0082.5253.00	DYTRONA	0082.5253	
P23	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P24	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P27	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P31 ..33	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P34	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P35	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P36	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P37	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P38	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P39	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P40	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P41	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P42	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P43	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P44	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P45	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P46	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P47	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
P48	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P49	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P50	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P51	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P700	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P710	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P720	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P730	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P900	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P901	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P902	VL LOETOESE 6,9 X 0,9 SOLDERING PIN	VL 0082.5253.00	DYTRONA	0082.5253	
P903	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P904	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P920	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P921	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P922	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P923	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P924	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P925	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P926	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P927	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P928	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P929	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P930	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P931	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P932	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P933	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P934	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P935	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P936	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P937	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P938	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P939	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P940	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P941	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P942	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P943	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P1A	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P1B	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
P1C	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P1D	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P1E	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P1F	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P1G	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P1H	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P1J	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
R1	RG 10K +-1% TK100 0603	RG 0009.5357.00	DRALORIC	CR 0603	
..7	SMD RESISTOR EIA0603				
R8	RG 47K +-1% TK100 0603	0009.7072.00	ROEDERSTEI	D11 0603	
	SMD RESISTOR EIA0603				
R9	RG 47K +-1% TK100 0603	0009.7072.00	ROEDERSTEI	D11 0603	
	SMD RESISTOR EIA0603				
R10	RG 10K +-1% TK100 0603	RG 0009.5357.00	DRALORIC	CR 0603	
..18	SMD RESISTOR EIA0603				
R19	RG 1KO +-1% TK100 0603	RG 0009.5340.00	DALE	CRCW 0603	
	SMD RESISTOR EIA0603				
R20	RG 1KO +-1% TK100 0603	RG 0009.5340.00	DALE	CRCW 0603	
	SMD RESISTOR EIA0603				
R21	RG 10K +-1% TK100 0603	RG 0009.5357.00	DRALORIC	CR 0603	
..33	SMD RESISTOR EIA0603				
R34	RG 10,0KOH+-0,1%TK25 1206	0009.7666.00	DRALORIC	M25TK25....0.1% 1206	
	SMD-RESISTOR				
R35	RG 10K +-1% TK100 0603	RG 0009.5357.00	DRALORIC	CR 0603	
..37	SMD RESISTOR EIA0603				
R38	RG 1KO +-1% TK100 0603	RG 0009.5340.00	DALE	CRCW 0603	
	SMD RESISTOR EIA0603				
R39	RG 1KO +-1% TK100 0603	RG 0009.5340.00	DALE	CRCW 0603	
	SMD RESISTOR EIA0603				
R40	RG 10K +-1% TK100 0603	RG 0009.5357.00	DRALORIC	CR 0603	
..42	SMD RESISTOR EIA0603				
R43	RG 1KO +-1% TK100 0603	RG 0009.5340.00	DALE	CRCW 0603	
	SMD RESISTOR EIA0603				
R45	RG 10K +-1% TK100 0603	RG 0009.5357.00	DRALORIC	CR 0603	
..48	SMD RESISTOR EIA0603				
R49	RG 1KO +-1% TK100 0603	RG 0009.5340.00	DALE	CRCW 0603	
	SMD RESISTOR EIA0603				
R50	RG 1KO +-1% TK100 0603	RG 0009.5340.00	DALE	CRCW 0603	
	SMD RESISTOR EIA0603				
R51	RG 470R +-1% TK100 0603	0009.6976.00	ROEDERSTEI	D11 0603	
	SMD RESISTOR EIA0603				
R52	RG 10,2KOH+-0,1%TK25 1206	0009.7614.00	PHILIPS_CO	MPC 01	
	SMD-RESISTOR				
R53	RG 100R +-1% TK100 0603	RG 0009.5334.00	DRALORIC	CR 0603	
..65	SMD RESISTOR EIA0603				
R66	RG 1,0 KO +-0,1%TK25 1206	0009.7595.00	DRALORIC	M25TK25....0.1% 1206	
	SMD-RESISTOR				
R67	RG 47K +-1% TK100 0603	0009.7072.00	ROEDERSTEI	D11 0603	
..70	SMD RESISTOR EIA0603				
R71	RG 1KO +-1% TK100 0603	RG 0009.5340.00	DALE	CRCW 0603	
..73	SMD RESISTOR EIA0603				
R74	RG 100R +-1% TK100 0603	RG 0009.5334.00	DRALORIC	CR 0603	
	SMD RESISTOR EIA0603				
R75	RG 10K +-1% TK100 0603	RG 0009.5357.00	DRALORIC	CR 0603	
	SMD RESISTOR EIA0603				
R76	RG 47K +-1% TK100 0603	0009.7072.00	ROEDERSTEI	D11 0603	
..83	SMD RESISTOR EIA0603				
R84	RG 10K +-1% TK100 0603	RG 0009.5357.00	DRALORIC	CR 0603	
	SMD RESISTOR EIA0603				
R85	RG 47K +-1% TK100 0603	0009.7072.00	ROEDERSTEI	D11 0603	
	SMD RESISTOR EIA0603				
R86	RG 47K +-1% TK100 0603	0009.7072.00	ROEDERSTEI	D11 0603	
	SMD RESISTOR EIA0603				
R87	RG 150R +-1% TK100 0603	0009.6947.00	ROEDERSTEI	D11 0603	
	SMD RESISTOR EIA0603				
R88	RG 10K +-1% TK100 0603	RG 0009.5357.00	DRALORIC	CR 0603	
..99	SMD RESISTOR EIA0603				
R100	RG 1KO +-1% TK100 0603	RG 0009.5340.00	DALE	CRCW 0603	
	SMD RESISTOR EIA0603				

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Kennz. Comp. No.	Benennung Designation		Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R101	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R102	RG 10R +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5328.00	YAGEO	RC0603	
R103	RG 1MO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5370.00	ROEDERSTEI	D11 0603	
R104	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R105	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R106	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R107 ..114	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R115 ..146	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R147 ..151	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R152	RG 200 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5608.00	DRALORIC	CR 1206	
R153	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R154	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R156 ..159	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R160 ..162	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R163 ..166	RG 47R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6924.00	DRALORIC	CR 0603	
R167	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R168	RG 2,0KOHM+-0,1%TK25 SMD-RESISTOR	1206	0009.7608.00	PHILIPS_CO	MPC 01	
R169 ..172	RG 0-OHM WIDERSTAND RESISTOR CHIP 0-OHM	1206	RG 0007.5108.00	DRALORIC	CR 1206	
R173	RG 88,7KOH+-0,1%TK25 SMD-RESISTOR	1206	0009.7650.00	PHILIPS_CO	MPC 01	
R174	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R175	RG 200 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5608.00	DRALORIC	CR 1206	
R176	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R177	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R178 ..185	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R186 ..199	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R200	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R201	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R202	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R203	RG 220R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6953.00	YAGEO	RC0603	
R204	RG 220R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6953.00	YAGEO	RC0603	
R205	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R206	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R207	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R208	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R209	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R210	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R211 ..217	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R218	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R219 ..221	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	

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Kennz. Comp. No.	Benennung Designation		Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R222	RG 39K2 +-1% TK100 SMD RESISTOR EIA0603	0603	0010.9823.00	PHILIPS_CO	RC 22 H	
R223	RG 182 OHM+-1%TK100 SMD RESISTOR EIA0603	0603	0009.9130.00	PHILIPS_CO	RC 22 H	
R224	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R225	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R226	RG 20KOH +-0,1% TK25 SMD-RESISTOR	1206	0009.7643.00	DRALORIC	M25TK25....0.1% 1206	
R227	RG 5K62 +-1% TK100 SMD RESISTOR EIA0603	0603	0010.8433.00	PHILIPS_CO	RC 22 H	
R228	RG 680R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6982.00	PHILIPS_CO	RC 22 H	
R229	RG 12,0KOH+-0,1%TK25 SMD-RESISTOR	1206	0009.7620.00	PHILIPS_CO	MPC 01	
R230	RG 100K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5363.00	PHILIPS_CO	RC 22 H	
R231	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R232	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R233	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R234	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R235 ..237	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R238	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R239 ..243	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R244	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R245	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R246	RG 100K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5363.00	PHILIPS_CO	RC 22 H	
R247	RG 1,0 KO +-0,1%TK25 SMD-RESISTOR	1206	0009.7595.00	DRALORIC	M25TK25....0.1% 1206	
R248	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R249 ..251	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R252	RG 2,21KOHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5743.00	DRALORIC	CR 1206	
R253 ..262	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R263	RG 1,69KOH+-0,1%TK25 SMD-RESISTOR EIA1206	1206	0009.9998.00	PHILIPS_CO	MPC 01	
R264	RG 10R +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5328.00	YAGEO	RC0603	
R265	RG 22K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7050.00	ROEDERSTEI	D11 0603	
R266	RG 4K7 +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7020.00	DRALORIC	CR 0603	
R267	RG 18K2+-1% TK100 SMD RESISTOR EIA0603	0603	0010.9317.00	PHILIPS_CO	RC 22 H	
R268	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R269	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R270	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R271 ..288	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R289 ..302	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R303 ..305	RG 100R +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5334.00	DRALORIC	CR 0603	
R306	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R307	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R308	RG 47K +-1% TK100 SMD RESISTOR EIA0603	0603	0009.7072.00	ROEDERSTEI	D11 0603	
R309	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R310	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R311 ..326	RG 47K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7072.00	ROEDERSTEI	D11 0603	
R350	RL 0,35W47,0KOHM+-0,1%T25 RESISTOR	RL 0084.4354.00	DRALORIC	SMA0207	
R351	RG 39R2 +-1% TK100 0603 SMD RESISTOR EIA0603	0010.9400.00	PHILIPS_CO	RC 22 H	
R591	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R592	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R593 ..596	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R597	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R598	NICHT BESTUECKT/NOT FITTED RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R991	NICHT BESTUECKT/NOT FITTED RS 0,5W 1K+-10% Q10XH5 CERMET TRIMMING POTENTIOM	2027.1446.00	DIPLOMATIC	P67 1K 10%	
R995	RS 0,5W 200K+-10% Q10XH5 POTENTIOMETER	1036.4377.00	DIPLOMATIC	P67 200K 10%	
U1	EL TONGEBER 6V 7MIA SMD AUDIO DEVICES	1081.0402.00	C&K	KMI-1240 KINGSTATE	
V2	AK BC860B P 45V 150MA TRANSISTOR	AK 0007.7975.00	MOTOROLA	BC860B	
V4 ..7	AD BAS216 75V UDI HIGHSPEED SWITCHING DIODE	0010.9346.00	PHILIPS_SE	BAS216	
V8	AD BAS216 75V UDI HIGHSPEED SWITCHING DIODE	0010.9346.00	PHILIPS_SE	BAS216	
V9	AE BZV55/C5V1 0.5W ZDI ZENER DIODE	AE 0006.9839.00	PHILIPS_SE	BZV55B5V1 (GEG)	
V10	AD BAV99 75V DUO UDI HIGH-SPEED DOUBLE DIODE	AD 0911.0092.00	VALVO	BAV99	
V11	AK BC850B N 45V 100MA TRANSISTOR	AK 0007.7969.00	VALVO	BC850B	
V12	AK BC850B N 45V 100MA TRANSISTOR	AK 0007.7969.00	VALVO	BC850B	
V13 ..20	AE HSMS2800 SCHOTTKY SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V22	AD BAS216 75V UDI HIGHSPEED SWITCHING DIODE	0010.9346.00	PHILIPS_SE	BAS216	
V23	AG MBRD360 SGL 60V 3A SCHOTTKY RECTIFIER	4024.7875.00	MOTOROLA	MBRD360T4	
X2	FP STIFTLEISTE 2P.R2,54 PIN CONNECTOR	FP 0009.5992.00			
X3	FP STIFTLEISTE 3P.R=2 CONNECTOR	FP 4039.4360.00	SAMTEC	TMM-103-03-S-S	
X4	FP STIFTLEISTE 8P.R2,54 PIN CONNECTOR	FP 0009.6182.00			
X31	DY BUCHSENLEISTE CABLE W31	1084.8562.00			
X33	FP STECKERLEISTE 10P.GER CONNECTOR 10P	0846.4593.00	SIEMENS	V23535-A2200-A102	
X34	FP STECKERLEISTE 26P.GER CONNECTOR 26P.	FP 0820.8610.00	SIEMENS	V23535-A2200-A262	
X35	DY BUCHSENLEISTE X315 BUCHSENLEISTE X315	1035.7337.00			
X36	FP LEITERPLATTENVERB.13P CONNECTOR	0840.6436.00	DUPONT CON	68100-013	
X37	FP LEITERPLATTENVERB.13P CONNECTOR	0840.6436.00	DUPONT CON	68100-013	
X85	FP STIFTLEISTE 2P.R=2 CONNECTOR	FP 1065.8931.00	SUYIN	20010S-02G2T	
X105	FP STIFTLEISTE 2P.R=2 CONNECTOR	FP 1065.8931.00	SUYIN	20010S-02G2T	
X106	FP STIFTLEISTE 2P.R=2 CONNECTOR	FP 1065.8931.00	SUYIN	20010S-02G2T	
X111	FP STIFTLEISTE 3P.R=2 CONNECTOR	FP 4039.4360.00	SAMTEC	TMM-103-03-S-S	
X112	FP STIFTLEISTE 3P.R=2 CONNECTOR	FP 4039.4360.00	SAMTEC	TMM-103-03-S-S	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
X300	FP STIFTLEISTE 2P.R=2 CONNECTOR	FP 1065.8931.00	SUYIN	20010S-02G2T	
X312	FP STIFTL.WIN 5P.R2,54 ANGLE PIN CONNECTOR	FP 0009.7214.00			
X501	FP STECKERLEISTE 50P.R=2 CONNECTOR 50P	FP 1051.4516.00	BERG_ELEKT	87131-550	
X502	FP STECKERLEISTE 50P.R=2 CONNECTOR 50P	FP 1051.4516.00	BERG_ELEKT	87131-550	
X700	FP STIFTLEISTE 2P.R=2 CONNECTOR	FP 1065.8931.00	SUYIN	20010S-02G2T	
X900	FP STIFTLEISTE 8P.R2,54 PIN CONNECTOR	FP 0009.6182.00			
X940	FP STIFTLEISTE 8P.R2,54 PIN CONNECTOR	FP 0009.6182.00			
X999	FP BUCHSENLEISTE 30POL. SOCKET CONNECTOR	FP 0283.1830.00	DUPONT CON	76325-...	

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ROHDE&SCHWARZ

XY-Liste

XY List

Erklärung der Spaltenbezeichnungen:

el. Kennz.	Bauelement-Kennzeichen
Seite	Leiterplatten-Seite, auf der sich das Bauelement befindet
X/Y	Koordinaten (in Millimeter) des Bauelementes auf der Leiterplatte bezogen auf den Nullpunkt
Planq., Bl.	Planquadrat und Seite des Schaltbildes für das jeweilige Bauelement

Explanation of column designations:

Part	Identification of instrument part
Side	Side of the PC board on which instrument part is positioned
X/Y	Coordinates (in units of millimeters) of the component on the PC board in reference to zero point
Sqr, Pg	Square and page of the diagram for the respective instrument part

Nicht–Service–Relevante Bauteile / Non–Service–Relevant Components

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
1	B	295	135	5B	7
2	B	329	135	5B	7
C1	B	214	7	3B	2
C2	B	212	7	3B	2
C3	A	221	97	7C	3
C4	A	55	104	3B	11
C5	A	53	104	3B	11
C6	A	63	102	3B	11
C7	A	65	102	3B	11
C8	A	68	102	3B	11
C9	A	60	104	3A	11
C10	A	58	104	3B	11
C11	B	124	44	5D	14
C12	A	22	74	5B	12
C13	A	18	74	5B	12
C14	A	219	82	7C	3
C15	B	190	44	3D	2
C16	B	209	31	3E	2
C17	B	190	31	3D	2
C18	A	219	77	7C	3
C19	B	57	16	3F	15
C20	B	209	47	3E	2
C21	B	177	36	3F	2
C22	B	176	32	3F	2
C23	A	102	43	2B	18
C24	B	272	65	3B	9
C25	B	142	64	4C	14
C26	B	55	78	7C	16
C27	B	75	78	7C	16
C28	B	55	69	6C	16
C29	B	75	64	6C	16
C30	B	183	25	2D	2
C31	A	198	48	4D	2
C32	A	207	28	2E	2
C33	A	215	47	4E	2
C34	B	173	23	3F	2
C35	A	177	43	4F	2
C36	A	234	67	8C	3
C37	B	211	111	2E	4
C38	B	161	75	1F	5
C39	B	164	90	2F	5
C40	B	79	85	3F	5
C41	B	164	106	2F	5
C42	B	123	107	4F	5
C43	A	258	43	6B	9
C45	A	205	80	1F	3
C46	B	127	82	1F	6
C47	B	255	34	6D	9
C48	B	144	82	2F	6
C50	B	293	129	2F	7
C51	A	167	128	3C	7
C52	B	334	76	8A	8
C53	B	250	23	6D	4
C55	A	227	75	2E	4
C56	A	208	67	1E	4
C57	B	334	34	8B	8
C58	B	334	97	8B	8
C59	B	334	55	8B	8
C60	B	270	98	1A	9
C61	A	271	81	3B	9
C62	B	321	121	2F	9
C63	A	237	16	5B	2
C64	B	3	126	7D	19
C65	B	194	66	3D	4
C69	B	55	114	1F	11
C70	B	87	142	2F	11
C71	B	27	112	3F	11
C72	B	41	113	3F	11
C73	B	53	128	4F	11
C74	B	6	102	1F	12
C75	B	27	124	2F	12
C76	B	17	87	2F	12
C77	B	3	86	3F	12
C78	B	41	125	4F	12
C79	B	17	77	4F	12
C80	B	149	38	1F	13
C81	B	137	21	4B	13
C82	B	142	13	4C	13
C83	B	151	13	2E	13
C84	B	151	23	2E	13
C85	B	119	24	3F	13
C86	B	137	44	6B	13
C87	B	146	38	6C	13
C88	B	181	46	2A	13
C89	A	144	30	3E	13
C90	A	140	30	3F	13
C91	B	158	43	8B	13
C92	B	152	42	7B	13
C93	B	177	48	3B	13
C94	B	135	52	2F	14
C95	B	147	65	4B	14
C96	B	118	40	5B	14
C97	B	128	39	5B	14
C99	B	102	117	4F	16
C100	B	229	104	8C	3
C101	B	18	67	3A	16
C102	B	59	80	3F	16
C103	B	53	142	1F	17
C104	B	117	128	7B	17
C105	B	135	145	8B	17
C106	B	136	110	8B	17
C107	A	140	126	8B	17
C108	B	35	142	3F	17
C109	B	73	127	4F	17
C110	B	105	141	2F	17
C111	B	73	118	2F	17
C112	B	28	7	4F	18
C113	B	222	31	7D	4
C114	B	34	28	2F	18
C115	B	17	37	3F	18
C116	B	12	7	3F	18
C117	B	37	54	2F	18
C118	B	173	52	3B	13
C119	B	32	127	2B	12
C120	B	140	56	7B	13
C121	B	266	88	3B	9
C122	B	69	80	7B	16
C123	B	70	64	7A	16
C124	A	82	80	7B	16
C125	A	86	74	7B	16
C126	B	238	104	8C	3
C127	A	245	104	7D	3
C128	A	256	96	7D	3
C129	A	256	76	8D	3
C130	A	256	87	7D	3
C131	B	200	95	2E	4
C132	B	276	109	4B	10
C133	B	302	106	4B	10
C135	B	79	59	6C	15
C136	B	90	42	6C	15
C137	A	225	68	8D	3
C138	B	67	49	7C	15
C139	B	247	67	8D	3
C140	B	208	107	2F	3
C141	B	111	82	3F	6
C142	B	276	89	4C	10
C143	B	301	87	4C	10
C144	A	234	21	5C	2
C145	A	231	21	5B	2
C146	A	187	26	2B	2
C147	A	187	21	2B	2
C148	A	192	21	2B	2
C149	A	192	26	2C	2
C150	A	197	21	2C	2
C151	A	199	25	2C	2
C152	A	203	20	2C	2
C153	A	204	13	2C	2
C154	A	208	20	2D	2
C155	B	208	7	2D	2
C156	A	207	12	3A	2
C157	B	210	7	3A	2
C158	B	216	7	3B	2
C159	B	218	8	3C	2
C160	A	217	20	3C	2
C161	A	219	20	3C	2
C162	A	221	13	3C	2
C163	A	221	20	3C	2
C164	B	224	7	3D	2
C165	A	224	20	5A	2
C166	A	317	124	2A	7
C167	A	212	20	3A	2
C168	B	226	9	5A	2
C169	B	230	9	5B	2
C170	B	228	9	5B	2
C171	A	245	82	2D	3
C172	B	43	60	4A	16
C173	B	276	42	7B	10
C174	B	303	40	8B	10
C175	B	277	62	8C	10
C176	B	302	59	8C	10
C177	A	248	81	3D	3
C178	B	207	120	2A	4
C179	B	207	111	2C	4
C180	A	220	111	2E	4
C181	B	94	36	2C	18
C182	A	296	21	8C	8
C183	A	309	20	5F	8
C184	B	247	111	8D	3
C185	B	248	126	8D	3
C186	B	73	109	5F	17
C187	B	161	122	3E	7
D1	B	279	66	6C	10
D2	B	279	46	3C	10
D3	B	195	87	2F	4
D3	B	195	87	7A	4
D4	B	6	115	6C	19
D4	B	6	115	7D	19
D5	B	251	123	6A	3
D5	B	251	123	6B	3
D5	B	251	123	7D	3
D6	B	210	103	2A	3
D6	B	210	103	2F	3
D6	B	210	103	4E	3
D6	B	210	103	4F	3
D6	B	210	103	6D	3
D7	A	208	87	1F	3
D7	A	208	87	2A	3
D7	A	208	87	2B	3
D8	A	208	98	2F	3
D8	A	208	98	3E	3
D8	A	208	98	3E	3
D8	A	208	98	3F	3
D8	A	208	98	5D	3
D10	B	250	101	3A	3
D10	B	250	101	8A	3
D11	B	279	113	3A	10
D13	A	219	120	2F	4
D13	A	219	120	3E	4
D13	A	219	120	3F	4
D13	A	219	120	3F	4
D13	A	219	120	4A	4
D14	B	217	114	1F	4
D14	B	217	114	3A	4
D15	B	194	69	4D	4
D17	B	332	90	4C	8
D17	B	332	90	8A	8
D18	B	332	49	6C	8
D18	B	332	49	8A	8
D19	B	332	111	4A	8
D19	B	332	111	8B	8
D20	B	332	69	6A	8
D20	B	332	69	8B	8

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ROHDE & SCHWARZ	Benennung: ED RECHNER_(FC) *Designation:* CPU_(FC)	Sprache: *Lang.:* de	Blatt: *Sh.:* 1 + / Aei: *C.I.:* 01.03
Typ: *Type:* SMIQ	Datum: *Date:* 97–11–20	Abteilung: *Dpt:* 1GPK	Name: *Name:* DR / Sachnr.: *Part No.:* **1084.8504.01 XY**

Nicht–Service–Relevante Bauteile / Non–Service–Relevant Components

el. Kennz. / Part	Seite / Side	X	Y	Planq. / Sqr	Bl. / Pg
D21	B	279	93	6A	10
D60	B	86	36	4B	15
D60	B	86	36	7C	15
D61	B	99	119	3E	16
D61	B	99	119	5D	16
D71	A	299	27	2A	8
D71	A	299	27	3A	8
D71	A	299	27	3E	8
D71	A	299	27	3E	8
D71	A	299	27	8C	8
D72	A	312	27	2B	8
D72	A	312	27	2B	8
D72	A	312	27	2C	8
D72	A	312	27	2C	8
D72	A	312	27	4F	8
D85	B	42	62	4B	16
D87	B	146	128	6A	17
D87	B	146	128	7A	17
D90	B	37	32	2F	18
D90	B	37	32	4A	18
D106	A	208	76	1F	4
D106	A	208	76	2D	4
D106	A	208	76	3D	4
D106	A	208	76	4B	4
D106	A	208	76	4F	4
D199	B	121	84	2F	6
D199	B	121	84	4D	6
D200	B	138	85	1F	6
D200	B	138	85	4B	6
D213	B	154	85	2F	6
D213	B	154	85	6B	6
D220	B	174	75	1F	5
D220	B	174	75	2A	5
D220	B	174	75	2B	5
D221	B	174	92	2C	5
D221	B	174	92	2D	5
D221	B	174	92	2F	5
D222	B	174	109	2F	5
D222	B	174	109	4C	5
D222	B	174	109	4D	5
D223	B	88	88	3F	5
D223	B	88	88	4A	5
D224	B	102	88	3F	5
D224	B	102	88	4B	5
D226	B	125	102	4F	5
D226	B	125	102	6B	5
D227	B	141	102	4F	5
D227	B	141	102	6A	5
D300	B	159	125	3C	7
D301	B	287	132	2F	7
D301	B	287	132	6B	7
D310	B	324	116	1E	9
D310	B	324	116	3D	9
D310	B	324	116	4F	9
D400	B	268	86	2A	9
D402	B	251	37	6B	9
D550	B	9	92	1E	12
D550	B	9	92	2C	12
D560	B	55	118	4F	11
D560	B	55	118	6C	11
D561	B	29	107	2F	11
D561	B	29	107	5D	11
D561	B	29	107	5D	11
D561	B	29	107	6D	11
D562	B	19	81	2E	12
D562	B	19	81	5E	12
D562	B	19	81	6C	12
D562	B	19	81	6C	12
D563	B	43	119	3E	12
D563	B	43	119	4A	12
D563	B	43	119	4B	12
D565	B	5	80	3E	12
D565	B	5	80	7B	12
D565	B	5	80	7B	12
D566	B	19	71	4E	12
D566	B	19	71	6B	12
D566	B	19	71	6B	12
D566	B	19	71	6C	12
D566	B	19	71	6C	12
D567	B	58	108	1F	11
D567	B	58	108	4B	11
D567	B	58	108	4C	11
D567	B	58	108	4C	11
D567	B	58	108	4C	11
D567	B	58	108	4C	11
D567	B	58	108	4C	11
D568	B	43	107	3F	11
D568	B	43	107	4D	11
D568	B	43	107	7B	11
D568	B	43	107	7B	11
D568	B	43	107	8B	11
D568	B	43	107	8B	11
D568	B	43	107	3C	16
D569	B	29	119	1E	12
D569	B	29	119	2A	12
D569	B	29	119	2B	12
D570	B	90	132	2F	11
D570	B	90	132	6B	11
D621	B	59	10	2B	15
D621	B	59	10	2F	15
D621	B	59	10	3E	15
D621	B	59	10	3F	15
D621	B	59	10	5B	15
D700	B	150	15	2F	13
D700	B	150	15	3B	13
D701	B	138	27	3F	13
D701	B	138	27	5B	13
D701	B	138	27	5C	13
D701	B	138	27	5C	13
D701	B	138	27	5D	13
D702	B	121	18	3D	13
D702	B	121	18	3F	13
D702	B	121	18	3B	14
D703	B	151	28	1F	13
D703	B	151	28	2C	13
D704	B	160	54	6B	13
D706	B	132	56	2E	14
D706	B	132	56	3C	14
D810	B	37	132	2B	17
D810	B	37	132	3F	17
D811	B	55	132	1F	17
D811	B	55	132	2C	17
D812	B	72	132	4B	17
D812	B	72	132	4F	17
D820	B	75	121	2F	17
D820	B	75	121	3C	17
D820	B	75	121	3C	17
D820	B	75	121	3D	17
D820	B	75	121	3D	17
D826	B	75	103	1E	17
D826	B	75	103	2E	17
D826	B	75	103	2E	17
D826	B	75	103	3E	17
D826	B	75	103	3F	17
D827	B	75	113	4D	17
D827	B	75	113	4D	17
D827	B	75	113	4D	17
D827	B	75	113	4F	17
D840	B	107	135	1F	17
D840	B	107	135	3A	17
D840	B	107	135	3A	17
D840	B	107	135	3D	17
D840	B	107	135	4E	17
D860	B	61	68	2F	16
D860	B	61	68	6A	16
D860	B	61	68	6A	16
D860	B	61	68	6B	16
D860	B	61	68	6B	16
D860	B	61	68	7C	16
D950	B	107	39	2B	18
D960	B	24	9	3F	18
D960	B	24	9	7A	18
D970	B	40	9	4F	18
D970	B	40	9	7B	18
D980	B	27	39	2F	18
D980	B	27	39	7C	18
G3	B	21	57	3A	16
G40	B	196	107	2C	4
G50	B	196	122	2B	4
G300	B	330	135	5B	7
K1	B	333	141	3B	7
K1	B	333	141	5A	7
L1	B	183	31	3D	2
L2	B	203	41	3E	2
L3	B	170	28	3F	2
L4	B	238	43	7D	4
L5	B	243	13	5D	4
N1	B	179	48	2A	13
N2	B	265	18	6D	4
N700	B	140	39	6C	13
N701	B	140	15	4B	13
N702	B	126	38	5B	14
N702	B	126	38	5C	14
P1	B	329	130	3A	7
P1A	B	329	130	2C	3
P1B	B	329	130	2C	3
P1C	B	329	130	2C	3
P1D	B	329	130	2C	3
P1E	B	329	130	2C	3
P1F	B	329	130	2C	3
P1G	B	329	130	2C	3
P1H	B	329	130	2C	3
P1J	B	329	130	2C	3
P2	B	194	78	6A	4
P3	B	197	78	6A	4
P4	B	199	78	6A	4
P5	B	204	78	6A	4
P6	B	202	78	6A	4
P7	B	197	96	7A	4
P8	B	114	115	7C	17
P9	B	117	120	6A	17
P10	B	114	123	6A	17
P11	B	117	125	7A	17
P12	B	117	123	7D	17
P13	B	114	125	6D	17
P14	B	114	117	7C	17
P15	B	222	47	8D	4
P16	B	114	120	7C	17
P17	B	117	117	7C	17
P18	B	88	109	5D	16
P21	B	200	48	4D	2
P22	B	218	41	4E	2
P23	B	213	47	4E	2
P24	B	179	43	4F	2
P27	B	53	60	5B	16
P31	B	267	119	2C	3
P32	B	269	116	2C	3
P33	B	267	116	2C	3
P34	B	260	34	5C	9
P35	B	260	32	5C	9
P36	B	262	34	5C	9
P37	B	262	32	5D	9
P38	B	243	47	7C	9
P39	B	245	47	7C	9
P40	B	243	44	7C	9
P41	B	245	44	7C	9
P42	B	243	39	7C	9
P43	B	245	42	7C	9
P44	B	243	42	7C	9
P45	B	245	39	7C	9
P46	B	243	34	7C	9
P47	B	245	37	7C	9

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Nicht–Service–Relevante Bauteile / Non–Service–Relevant Components

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
P48	B	243	37	7C	9
P49	B	245	34	7C	9
P50	B	257	34	7D	9
P51	B	257	32	7D	9
P700	B	129	44	5C	14
P710	B	146	19	4B	13
P720	B	170	43	3A	13
P730	B	156	43	6C	13
P900	B	264	23	7D	4
P901	B	259	23	7C	4
P902	B	257	23	6D	4
P903	B	267	23	6D	4
P904	B	262	23	6D	4
P920	B	164	141	4C	7
P921	B	162	141	4C	7
P922	B	162	144	4D	7
P923	B	159	141	4D	7
P924	B	159	144	4D	7
P925	B	157	141	4D	7
P926	B	151	126	4D	7
P927	B	154	126	4D	7
P928	B	151	124	4D	7
P929	B	151	121	4D	7
P930	B	154	124	4D	7
P931	B	154	121	4D	7
P932	B	151	119	4D	7
P933	B	164	144	3D	7
P934	B	175	133	3D	7
P935	B	173	133	3D	7
P936	B	175	131	2D	7
P937	B	173	131	3D	7
P938	B	175	128	3D	7
P939	B	175	126	3D	7
P940	B	173	128	3D	7
P941	B	173	126	3D	7
P942	B	219	74	2D	4
P943	B	219	71	2D	4
R1	A	40	75	4C	16
R2	B	275	112	2A	10
R3	B	298	96	2B	10
R4	B	275	47	2C	10
R5	B	298	48	2D	10
R6	B	298	30	2D	10
R7	B	208	75	3B	4
R8	A	132	87	3B	6
R9	A	132	85	3B	6
R10	B	320	117	4F	9
R11	B	297	67	6D	10
R12	A	333	131	2B	7
R13	B	275	94	6A	10
R14	B	298	76	6B	10
R15	A	83	94	4B	5
R16	A	83	91	4B	5
R17	B	275	66	6C	10
R18	B	299	50	6D	10
R19	B	275	111	2A	10
R20	B	298	98	2B	10
R21	B	43	128	3A	12
R22	B	48	128	3A	12
R23	B	47	127	3B	12
R24	B	45	127	3B	12
R25	B	29	77	6C	12
R26	B	22	79	4F	12
R27	B	7	77	7A	12
R28	B	9	77	7A	12
R29	B	29	115	2B	12
R30	B	32	115	2B	12
R31	B	39	126	2A	12
R32	B	123	27	3C	13
R33	B	142	35	5C	13
R34	B	137	36	5B	13
R35	B	123	15	2B	14
R36	B	125	15	2B	14
R37	B	127	15	2B	14

el. Kennz *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
R38	B	297	114	2B	10
R39	B	275	45	2C	10
R40	B	95	109	4C	16
R41	B	90	106	4C	16
R42	B	95	107	4C	16
R43	B	298	31	2C	10
R45	A	144	117	6C	17
R46	A	137	124	7B	17
R47	A	131	134	6A	17
R48	B	44	28	4A	18
R49	B	299	51	6C	10
R50	B	275	65	6C	10
R51	A	334	123	2A	7
R52	A	268	88	3B	9
R53	B	68	102	2B	11
R54	B	65	102	2C	11
R55	B	63	102	2C	11
R56	B	60	102	2C	11
R57	B	58	102	2C	11
R58	B	55	102	2C	11
R59	B	53	102	2D	11
R60	B	14	67	5B	12
R61	B	14	72	5B	12
R62	B	65	80	6B	16
R63	B	68	65	6A	16
R64	A	78	81	6A	16
R65	A	83	75	6B	16
R66	B	135	24	5C	13
R67	A	132	96	4B	6
R68	A	132	94	4B	6
R69	A	132	92	4B	6
R70	A	132	89	3B	6
R71	B	275	92	6A	10
R72	B	298	78	6B	10
R73	B	297	94	5B	10
R74	A	242	79	2D	3
R75	A	219	124	4A	4
R76	A	20	122	6C	19
R77	A	18	122	6C	19
R78	A	15	122	6C	19
R79	A	13	122	6C	19
R80	A	11	122	5C	19
R81	A	8	122	5C	19
R82	A	6	122	5C	19
R83	A	4	122	5C	19
R84	B	219	121	3B	4
R85	B	109	131	2A	17
R86	B	112	131	2A	17
R87	B	14	57	7D	18
R88	B	219	119	3B	4
R89	B	267	94	1B	9
R90	A	58	95	2B	11
R91	A	55	95	2B	11
R92	A	53	95	2B	11
R93	A	60	95	2A	11
R94	A	63	93	2B	11
R95	A	65	93	2B	11
R96	A	68	93	2B	11
R97	B	43	105	7B	11
R98	A	245	93	5C	3
R99	A	242	93	5C	3
R100	B	214	9	3B	2
R101	B	212	9	3B	2
R102	B	139	60	4C	14
R103	B	147	15	3C	13
R104	A	46	74	4C	16
R105	A	38	75	5C	16
R106	A	39	66	5C	16
R107	A	247	93	5C	3
R108	A	249	93	5C	3
R109	B	210	85	2B	3
R110	B	212	85	2B	3
R111	B	215	84	2B	3
R112	B	213	85	2B	3

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
R113	A	247	75	2E	3
R114	A	249	88	2C	3
R115	A	211	128	2D	19
R116	A	213	139	2D	19
R117	A	213	129	2D	19
R118	A	216	139	2C	19
R119	A	221	128	2C	19
R120	A	226	140	2C	19
R121	A	224	129	2C	19
R122	A	224	140	2C	19
R123	A	231	128	2B	19
R124	A	231	140	2B	19
R125	A	229	128	2B	19
R126	A	241	140	2A	19
R127	A	239	128	2B	19
R128	A	234	140	2B	19
R129	A	241	128	2A	19
R130	A	244	140	2A	19
R131	A	218	54	1D	19
R132	A	224	54	1D	19
R133	A	226	54	1D	19
R134	A	231	54	1C	19
R135	A	229	54	1C	19
R136	A	228	64	1C	19
R137	A	234	54	1C	19
R138	A	239	54	1C	19
R139	A	236	54	1B	19
R140	A	241	64	1B	19
R141	A	241	54	1B	19
R142	A	246	54	1B	19
R143	A	244	54	1B	19
R144	A	249	54	1A	19
R145	A	254	54	1A	19
R146	A	251	54	1A	19
R147	A	247	88	2C	3
R148	A	245	88	2C	3
R149	A	240	93	2C	3
R150	A	243	98	2B	3
R151	A	228	89	3B	3
R152	A	238	89	3C	3
R153	A	212	101	3F	3
R154	A	213	105	4F	3
R156	A	86	131	3C	17
R157	A	86	133	3C	17
R158	B	111	143	4E	17
R159	A	73	106	1E	17
R160	A	211	54	2B	19
R161	A	216	54	2A	19
R162	A	213	54	2A	19
R163	A	125	120	7C	17
R164	A	140	120	7C	17
R165	A	129	120	7C	17
R166	A	137	120	7C	17
R167	B	219	117	2B	4
R168	B	140	24	5C	13
R169	B	268	59	4B	9
R170	B	135	47	1E	14
R171	B	119	32	5A	14
R172	B	130	41	5B	14
R173	A	272	84	3B	9
R174	B	219	115	2B	4
R175	A	238	86	3C	3
R176	A	225	123	3F	4
R177	A	214	20	3A	2
R178	A	201	54	2B	19
R179	A	198	54	2C	19
R180	A	193	54	2C	19
R181	A	196	54	2C	19
R182	A	191	54	2D	19
R183	A	182	116	3D	19
R184	A	193	116	3D	19
R185	A	182	119	3D	19
R186	B	163	19	2C	13
R187	B	159	24	2C	13

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ROHDE & SCHWARZ	Benennung: *Designation:* ED RECHNER_(FC) CPU_(FC)	Sprache: *Lang.:* de	Blatt: *Sh.:* 3 + / Aei: *C.I.:* 01.03
Typ: *Type:* SMIQ	Datum: *Date:* 97–11–20	Abteilung: *Dpt:* 1GPK	Name: *Name:* DR
			Sachnr.: *Part No.:* **1084.8504.01 XY**

Nicht–Service–Relevante Bauteile / Non–Service–Relevant Components

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
R188	B	161	16	2C	13
R189	B	230	7	5B	2
R190	B	228	7	5A	2
R191	B	226	7	5A	2
R192	B	153	13	3C	13
R193	B	147	17	3C	13
R194	B	157	23	3C	13
R195	B	152	117	6C	17
R196	B	152	115	6C	17
R197	B	152	113	6C	17
R198	B	152	111	6C	17
R199	A	125	125	8B	17
R200	A	208	54	2B	19
R201	A	226	94	2A	3
R202	A	206	54	2B	19
R203	A	334	143	3B	7
R204	A	319	125	2A	7
R205	A	37	86	7A	2
R206	A	193	119	3C	19
R207	A	221	54	2A	19
R208	A	288	133	7C	7
R209	A	269	64	3A	9
R210	A	193	124	3C	19
R211	B	15	68	5B	12
R212	B	15	70	5B	12
R213	B	137	16	4B	13
R214	A	157	50	6B	13
R215	A	170	45	3A	13
R216	B	127	44	5C	14
R217	B	127	36	6C	14
R218	A	182	129	3C	19
R219	B	28	53	7D	18
R220	A	20	40	7D	18
R221	B	28	36	6D	18
R222	A	339	132	4B	7
R223	B	122	36	6C	14
R224	A	162	130	3C	7
R225	A	163	134	3C	7
R226	A	143	41	6B	13
R227	B	272	98	2A	9
R228	A	129	125	7B	17
R229	B	145	24	5C	13
R230	B	28	126	2B	12
R231	B	270	61	3B	9
R232	A	193	126	3C	19
R233	A	182	126	3C	19
R234	A	91	127	5A	11
R235	A	195	140	3B	19
R236	A	193	129	3B	19
R237	A	193	140	3B	19
R238	A	200	83	6B	4
R239	A	206	128	3A	19
R240	A	206	140	3B	19
R241	A	201	129	3B	19
R242	A	208	140	3A	19
R243	A	208	128	3A	19
R244	A	200	121	1B	4
R245	A	200	106	2C	4
R246	B	303	114	3A	10
R247	A	263	27	6C	4
R248	A	239	16	5B	2
R249	A	213	116	3A	4
R250	A	290	129	6B	7
R251	B	89	53	3D	15
R252	A	285	4	7E	2

el. Kennz *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
R253	A	93	127	5A	11
R254	B	221	123	3B	4
R255	B	208	71	1D	4
R256	B	205	74	3D	4
R257	B	209	73	4F	4
R258	A	197	72	3D	4
R259	A	197	70	3D	4
R260	A	303	18	3F	8
R261	B	102	32	1B	18
R262	A	100	44	1B	18
R263	A	256	27	7C	4
R264	B	212	73	2D	4
R265	A	233	75	2E	4
R266	A	199	76	4D	4
R267	B	205	71	3D	4
R268	A	104	138	5A	11
R269	A	104	136	5A	11
R270	A	203	54	2B	19
R271	A	97	93	4B	5
R272	B	155	106	6B	5
R273	B	155	104	6B	5
R274	B	136	105	6C	5
R275	B	106	101	7C	5
R276	B	106	105	7D	5
R277	A	168	93	2D	5
R278	A	168	110	4D	5
R279	A	116	85	3C	6
R280	A	116	88	3C	6
R281	A	116	90	3C	6
R282	A	116	92	3C	6
R283	A	116	95	4C	6
R284	A	123	95	4C	6
R285	A	123	93	4C	6
R286	A	116	83	3C	6
R287	B	64	18	3F	15
R288	A	255	43	5B	9
R289	A	236	21	5B	2
R290	A	229	21	5B	2
R291	A	185	21	2B	2
R292	A	185	26	2B	2
R293	A	190	21	2B	2
R294	A	190	26	2B	2
R295	A	195	21	2C	2
R296	A	199	27	2C	2
R297	A	205	20	2C	2
R298	A	210	20	2D	2
R299	B	208	9	2D	2
R300	A	204	10	3A	2
R301	B	210	9	3A	2
R302	B	216	9	3B	2
R303	B	218	9	3C	2
R304	A	226	20	5A	2
R305	B	224	9	3D	2
R306	B	255	52	5B	9
R307	A	205	64	2C	19
R308	A	199	64	2C	19
R309	A	331	119	4F	9
R310	A	24	60	3A	16
R311	A	255	125	4A	19
R312	A	255	123	4A	19
R313	A	255	115	4B	19
R314	A	255	117	4B	19
R315	A	255	120	4A	19
R316	A	255	107	4B	19
R317	A	255	110	4B	19

el. Kennz. *Part*	Seite *Side*	X	Y	Planq. *Sqr*	Bl. *Pg*
R318	A	255	112	4B	19
R319	A	232	115	4C	19
R320	A	232	110	4C	19
R321	A	232	107	4C	19
R322	A	232	112	4C	19
R323	A	232	117	4C	19
R324	A	232	120	4D	19
R325	A	232	123	4D	19
R326	A	232	125	4D	19
R350	B	106	144	2D	17
R351	A	–21	–22	4A	4
R591	B	3	111	5D	19
R592	B	6	111	5D	19
R593	B	7	111	5D	19
R594	B	9	111	5D	19
R595	B	13	111	6D	19
R596	B	14	111	6D	19
R597	B	16	111	6D	19
R598	B	18	111	6D	19
R991	A	166	5	5E	2
R995	A	182	5	5E	2
U1	B	27	138	8B	6
V2	A	333	126	2A	7
V4	B	214	75	2D	4
V5	A	233	77	2D	4
V6	A	336	136	5A	7
V7	A	329	127	3A	7
V8	A	266	62	3A	9
V9	B	332	127	3A	7
V10	A	122	36	6C	14
V11	A	339	128	2B	7
V12	B	269	94	2B	9
V13	A	323	126	2A	7
V14	A	336	138	3B	7
V15	A	50	96	3C	12
V16	A	46	96	3C	12
V17	A	41	96	3C	12
V18	B	28	93	3C	12
V19	B	28	101	3D	12
V20	B	28	97	3D	12
V22	A	286	9	7E	2
V23	B	229	31	7D	4
X2	B	180	23	2D	2
X3	B	266	79	2E	3
X4	B	266	29	6B	9
X31	B	173	15	1A	2
X33	B	84	78	8A	2
X34	B	105	22	8B	2
X35	B	9	36	6B	2
X36	B	68	89	6A	2
X37	B	68	99	5C	2
X85	B	153	24	4C	13
X105	B	204	96	2C	4
X106	B	207	115	2B	4
X111	B	99	101	6D	5
X112	B	102	101	7D	5
X300	B	329	140	4B	7
X312	B	292	14	7E	2
X501	B	340	75	3A	20
X502	B	340	23	5A	20
X700	B	26	67	4A	16
X900	B	111	51	1A	18
X940	B	180	115	2C	7
X999	B	257	133	2A	21

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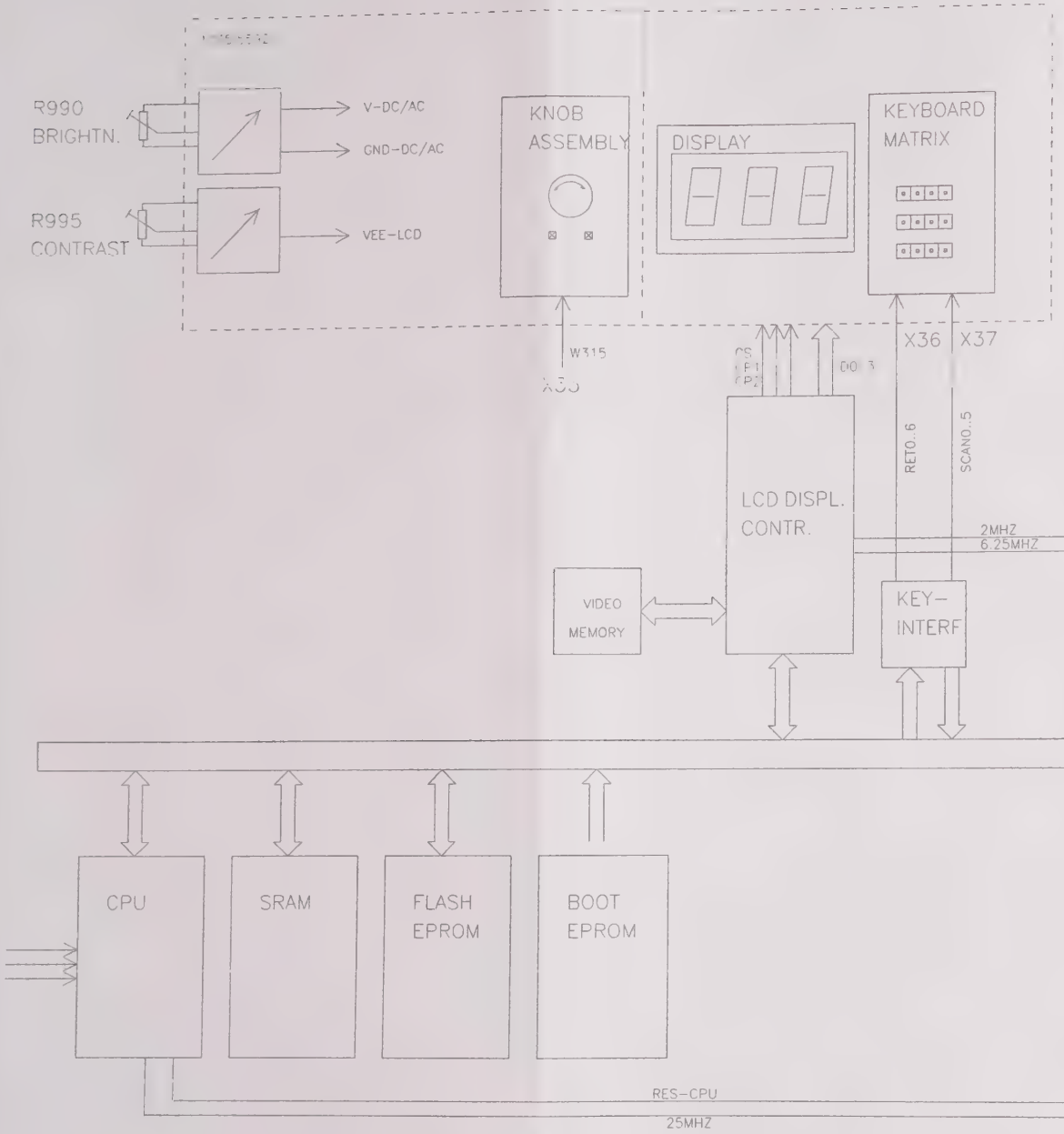
ROHDE&SCHWARZ

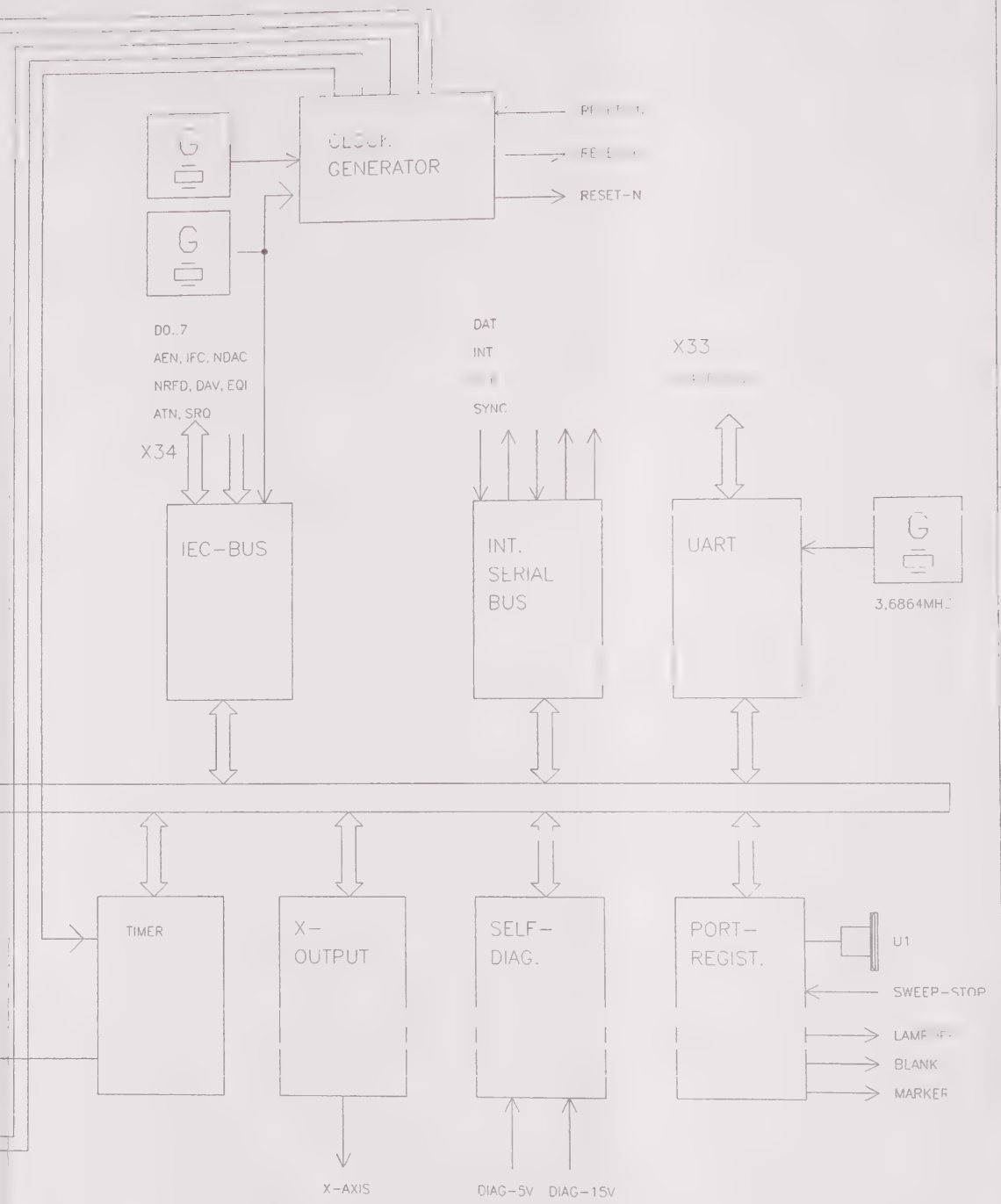
Stromläufe
Bestückungspläne

Circuit diagrams
Component plans

Schémas de circuit
Plans des composants

BEHALTEN WIR UNS ALLE RECHTE VOR





Bindende Angaben ueber Varianten, Trimmwerte, Bauteile und nicht bestueckte Bauteile siehe SA.

FOR BINDING INFORMATION ON MODELS, TRIMMING AND COMPONENTS VALUES AND NONFITTED COMPONENTS SEE PARTS LIST

X31 FROM MOTHERBOARD

W31 → +15V
→ -15V
→ VD5-P

X312 STANDBY /LED

AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME
03.01			

1GPK	DATUM	NAME	BENENNUNG
BEARB.		DR	RECHNER (FC)
GEPR.			FAST CPU
NORM			TOP/TOP 1
PLOTT	99-01-25	DRDORNER	

RÖHDE&SCHWARZ

ZU GERAET SMIQ

ZEICHN.-NR. 1084.8504.01 S

BLATT-NR 1 +

REG.V 1084 8004

ERSTE Z. 1084 8004.01

© ALLE RECHTE VOR
HERAUSGABE SOWIE VERVIELFÄLTIGUNG DIESER UNTERLAGEN, VERWERTUNG UND MITTEILUNG IHRES INHALTES NICHT GESTATTET, SOWEIT NICHT AUSDRÜCKLICH ZUGESTANDEN. ZUWIDERHANDLUNGEN VERPFLICHTEN ZU SCHADENERSATZ.

FROM MOTHERBOARD

X31 18 — C147 100P — C146 100P — R290 1K — INPUT

X31 21 — GND

INPO2 — R293 1K — C148 100P — (6/20)

INPO3 — R294 1K — C149 100P — (6/20)

INPO4 — R295 1K — C150 100P — (6/20)

X31 24 — INPO5 — R296 1K — C151 100P — (6/20)

POWER-SWITCHGND

POWER-SWITCH — R297 1K — C152 1N — (2/7E)

X31 27 — VS15_P — C153 100P — (2/7E)

R298 1K — RESERVE — C154 100P — (20/2C,4/5D,15/2B,16/2C,17/5A,18/4A)

R299 1K — RESERVE — C155 100P — (6/7B)

MODCTRL-OUT — R300 1K — C156 100P

MODCTRL-IN — R301 1K — C157 100P — (6/2C)

SWEEP-STOP — R177 1K — C167 100P — (6/2C)

MARKER — R101 1K — C2 100P — (6/7B)

BLANK — R100 1K — C1 100P — (6/7B)

AC-FAIL — R302 1K — C158 100P — (17/1D)

SYSRESET — R303 100 — C159 100P — (4/1D)

SERBUS-SYNC — C160 47P — (17/8C)

SERBUS-INT — C161 47P — (17/8C)

SERBUS-DAT — C162 47P — (17/8C)

SERBUS-CLK — C163 47P — (17/8C)

AUX-TRIG — R305 100 — C164 100P — (17/1A)

+5VC (2/80,4/50)

P21 +5V — C30 100N — C17 47U — L1 2,5uH — C31 100N

FANUNIT 1084 8927 — R327 240 — R155 240 — R44 240 — M — E2

VA15_P

P23 +15V — L2 2,5uH — C32 100N — C16 470U — C33 100N

P24 15V — L3 2,5uH — C34 100N — C35 100N

TO KEYBOARD X37

X37 1 RET0 (11/2C)
X37 2 RET1 (11/2C)
X37 3 RET2 (11/2C)
X37 4 RET3 (11/2C)
X37 5 RET4 (11/2C)
X37 6 RET5 (11/2C)
X37 7 RET6 (11/2D)
X37 8 SCAN0 (12/4C)
X37 9 SCAN1 (12/4C)
X37 10 SCAN2 (12/4C)
X37 11 SCAN3 (12/4D)
X37 12 SCAN4 (12/4D)
X37 13 SCAN5 (12/4D)

X31 4 — C165 100P — R304 100 — (17/1A)

X31 43 — C166 100P — R191 1K — DIAG-15V (13/2B)

X31 44 — C170 100P — R190 1K — DIAG-5V (13/2B)

X31 45 — C169 100P — R189 1K — (13/2E,14/8C)

X31 46 — UBEXT (7/1A)

X31 47 — C145 100P — R290 1K — DONE (17/1D)

X31 48 — C144 100P — R288 1K — NBUSY1 (6/2C)

X31 50 — C144 100P — R289 1K — NBUSY2 (6/2C)

BRIGHTNESS — R991 1K — POT6 (2/7C) — POT5 (2/7C) — POT4 (2/7C)

CONTRAST — R995 200K — POT3 (2/7C) — POT2 (2/7B) — POT1 (2/7B)

TO KNOB INTERFACE

X35 1 — VA15-P (2/7B,2/8C)
X35 2 — POT1 (2/7E)
X35 3 — VA15-P (2/7B,2/8C)
X35 4 — POT2 (2/6E)
X35 5 — VA15-P (2/7B,2/8C)
X35 6 — POT3 (2/6E)
X35 7 — VA15-P (2/6E)
X35 8 — KNOB1 (12/5B)
X35 9 — POT4 (12/5B)
X35 10 — KNOB2 (12/5B)
X35 11 — POT5 (2/5E)
X35 12 — LCD-D3 (18/8D)
X35 13 — POT6 (2/5E)
X35 14 — LCD-CS (18/8D)
X35 15 — LAMPOFF (6/7C)
X35 16 — LCD-CP1 (18/8D)
X35 17 — +5V
X35 18 — LCD-CP2 (18/8C)
X35 19 — LCD-D0 (18/8C)
X35 20 — LCD-D1 (18/8C)
X35 21 — LCD-D2 (18/8C)
X35 22

R205 1K

TO IEC625-BUS

X34 1 — DIO-1 (15/5B)
X34 2 — DIO-2 (15/5B)
X34 3 — DIO-3 (15/5B)
X34 4 — DIO-4 (15/5B)
X34 5 — DIO-5 (15/5B)
X34 6 — DIO-6 (15/5C)
X34 7 — DIO-7 (15/5E)
X34 8 — DIO-8 (15/5E)
X34 9 — EOI (15/5C)
X34 10 — REN (15/5C)
X34 11 — DAV (15/5C)
X34 12
X34 13 — NRFD (15/5C)
X34 14
X34 15 — NDAC (15/5C)
X34 16 — IFC (15/5C)
X34 17
X34 18 — SRQ (15/5C)
X34 19
X34 20
X34 21 — ATN (15/5C)
X34 22
X34 23
X34 24
X34 25
X34 26 — GND

X33 3 — RXD (16/7B)
X33 4
X33 5 — TXD (16/7A)
X33 6 — CTS (16/7B)
X33 7 — RTS (16/7B)
X33 8

X314 1 — +15V
X314 2 — -15V
X314 3 — +5V
X314 4
X314 5 — GND

POWER-SWITCHGND
POWER-SWITCH — +15V — V22 BAS216 — FRONTM

X312 1
X312 2
X312 3
X312 4
X312 5

AEND. IND	ÄNDERUNGS-MITTEILUNG		1GPK	DATUM	NAME
			ERSATZ		DR
			GEPR.		
			NORM		
			PLOTT	84-01-	BENENNER

03.01

RECHNER
FAST CPU
POWER SUPPLY
1084 8927.mnc
BLATT-NR 2

CPU

D7 74ACT20M

W/R

TST-D/C (21/4D)

TST-SUP (21/4D)

(5/4D,7/2C,9/5B,21/4C)

D6 74ACT32M

WR-PERI1 (17/5A) (5/7C,14/2C,15/2B,16/2C,16/2D)

+3.3V R201 10K

TST-READY

TST-BTERM

TST-WAIT

BLAST

+5V R111 10K R109 10K R112 R110

S-DT/R (3/58,21/4C)

S-DEN (3/60,21/4C)

TST-LOCK (21/4D)

D7 74ACT20M

RDY-PERILCD (18/2C)

RDY-FLASH (9/5C)

TST-HOLD

R151 10K

TST-HOLDA (21/4B)

R150 10K

+3.3V TST-BOFF

TST-BREQ (21/4D)

TST-BSTALL (21/4D)

P33 P32 P31

TST-CT0 TST-CT1 TST-CT2

TST-CT3 (21/7C)

P1H P1E P1F P1C P1G P1D P1A

TST-STEST TST-FAIL TST-ONCE TST-TCK TST-TDI TST-TDO TST-TRST TST-TMS

P1J

R114 10K R147 10K R149 10K R148 10K

+5V R175 200 R152 200

TST-VCC5

CLKCPU (20/7C,21/7B,14B,7/2C,9/5B,10/1A,10/5A)

RES-N (4/50.6/2A,7/1B,7/5D.9/8C) (10/1A,12/2C,13/2C,14/2C) (17/1A,18/3C,20/2D,21/7B)

R74 100

+3.3V TST-VCCPLL

C171 4.7U C177 100N

X3 03ST X3 03ST X3 03ST

200HZ (4/8C)

100HZ (4/8C)

R113 10K

+3.3V TST-NMI

XTRIG

TST-XINT0

T2-INT0 (17/4A,21/7B)

T2-INT2 (17/4B,21/7A)

(16/7D,21/7A)

(16/7D,21/5E)

(15/5B,21/5D)

(16/2C,21/5D)

(17/5D,21/5D)

D7 74ACT20M C45 100N D6 74ACT32M C140 100N D8 74ACT08M

D5 74ACT08M D8 74ACT08M R153 10K

D6 74ACT32M D6 74ACT32M R154 10K

D10 80960HD 50

W/R 88
D/C 96
SUP 97
ADS 77
READY 68
BTERM 67
WAIT 90
BLAST 84
DT/R 89
DEN 85
LOCK 99
HOLD 69
HOLDA 72
BOFF 10
BREQ 100
BSTALL 91
CT0 183
CT1 182
CT2 181
CT3 180
STEST 208
FAIL 5
ONCE 6
TCK 194
TDI 191
TDO 188
TRST 193
TMS 192
VCC5 197
VCCPLL 177
CLKIN 175
RESET 174
NMI 159
XINT0 169
XINT1 168
XINT2 167
XINT3 166
XINT4 163
XINT5 162
XINT6 161
XINT7 160

D0 12 D0-MEM
D1 13 D1-MEM
D2 14 D2-MEM
D3 15 D3-MEM
D4 20 D4-MEM
D5 21 D5-MEM
D6 22 D6-MEM
D7 23 D7-MEM
D8 26 D8-MEM
D9 27 D9-MEM
D10 28 D10-MEM
D11 29 D11-MEM
D12 34 D12-MEM
D13 35 D13-MEM
D14 36 D14-MEM
D15 37 D15-MEM
D16 39 D16-MEM
D17 40 D17-MEM
D18 41 D18-MEM
D19 42 D19-MEM
D20 45 D20-MEM
D21 50 D21-MEM
D22 51 D22-MEM
D23 52 D23-MEM
D24 54 D24-MEM
D25 55 D25-MEM
D26 56 D26-MEM
D27 57 D27-MEM
D28 61 D28-MEM
D29 62 D29-MEM
D30 63 D30-MEM
D31 64 D31-MEM

DP0 206 TST-DP0 R98
DP1 207 TST-DP1 R99 10K
DP2 203 TST-DP2 R107
DP3 202 TST-DP3 R108 10K
PCHK 189 TST-PCHK (21/7C)

BE0 83 BE0-MEM
BE1 82 BE1-MEM
BE2 79 BE2-MEM
BE3 78 BE3-MEM
A2 151 A2-MEM
A3 150 A3-MEM
A4 147 A4-MEM
A5 146 A5-MEM
A6 145 A6-MEM
A7 144 A7-MEM
A8 141 A8-MEM
A9 140 A9-MEM
A10 139 A10-MEM
A11 138 A11-MEM
A12 135 A12-MEM
A13 134 A13-MEM
A14 133 A14-MEM
A15 132 A15-MEM
A16 127 A16-MEM
A17 126 A17-MEM
A18 125 A18-MEM
A19 124 A19-MEM
A20 121 A20-MEM
A21 120 A21-MEM
A22 119 A22-MEM
A23 118 A23-MEM
A24 113 A24-MEM
A25 112 A25-MEM
A26 111 A26-MEM
A27 110 A27-MEM
A28 107 A28-MEM
A29 106 A29-MEM
A30 105 A30-MEM
A31 104 A31-MEM

S-DT/R (3/38,21/4C)

D5 74ABT16245

D0-MEM D1-MEM D2-MEM D3-MEM D4-MEM D5-MEM D6-MEM D7-MEM
D0-PERI D1-PERI D2-PERI D3-PERI D4-PERI D5-PERI D6-PERI D7-PERI

D5 74ABT16245

D8-MEM D9-MEM D10-MEM D11-MEM D12-MEM D13-MEM D14-MEM D15-MEM
D8-PERI D9-PERI D10-PERI D11-PERI D12-PERI D13-PERI D14-PERI D15-PERI

A30-MEM A31-MEM

D8 74ACT08M D6 74ACT32M

CS-PERI (7/5E)

S-DEN (3/38,21/4C)

D10 80960HD

+3.3V C3 100N C14 100N C18 C36 C100 C126

+3.3V C127 100N C128 100N

+5V D5 74ABT16245 C184 100N C185 100N

Bindende Angaben über Trimmwerte, Bauteile und nicht bestueckte Bauteile siehe SA

TRIMMING AI NONFITTED

D-BUS-PER

AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME
03.01			

1GPK	DATUM	NAME
BEARB.		DR
GEPR.		
NORM		
PLOTT	99-01-25	DRDORNER

ROHDE&SCHWARZ

ZU GERAET SMIQ

BENENNUNG

RECHNER (FC)

FAST CPU

TOP/TOP.3

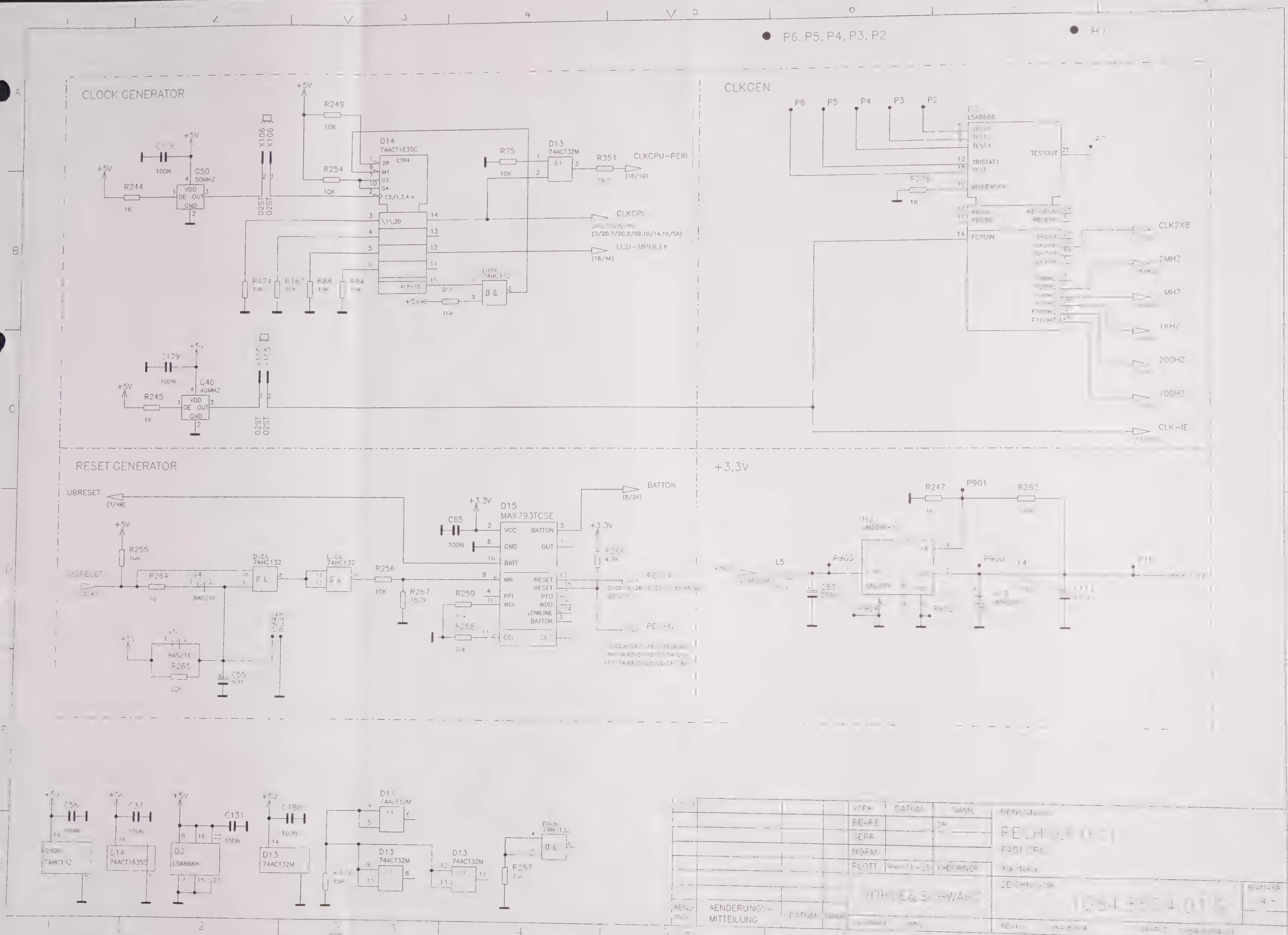
ZEICHN.-NR. 1084.8504.01 S

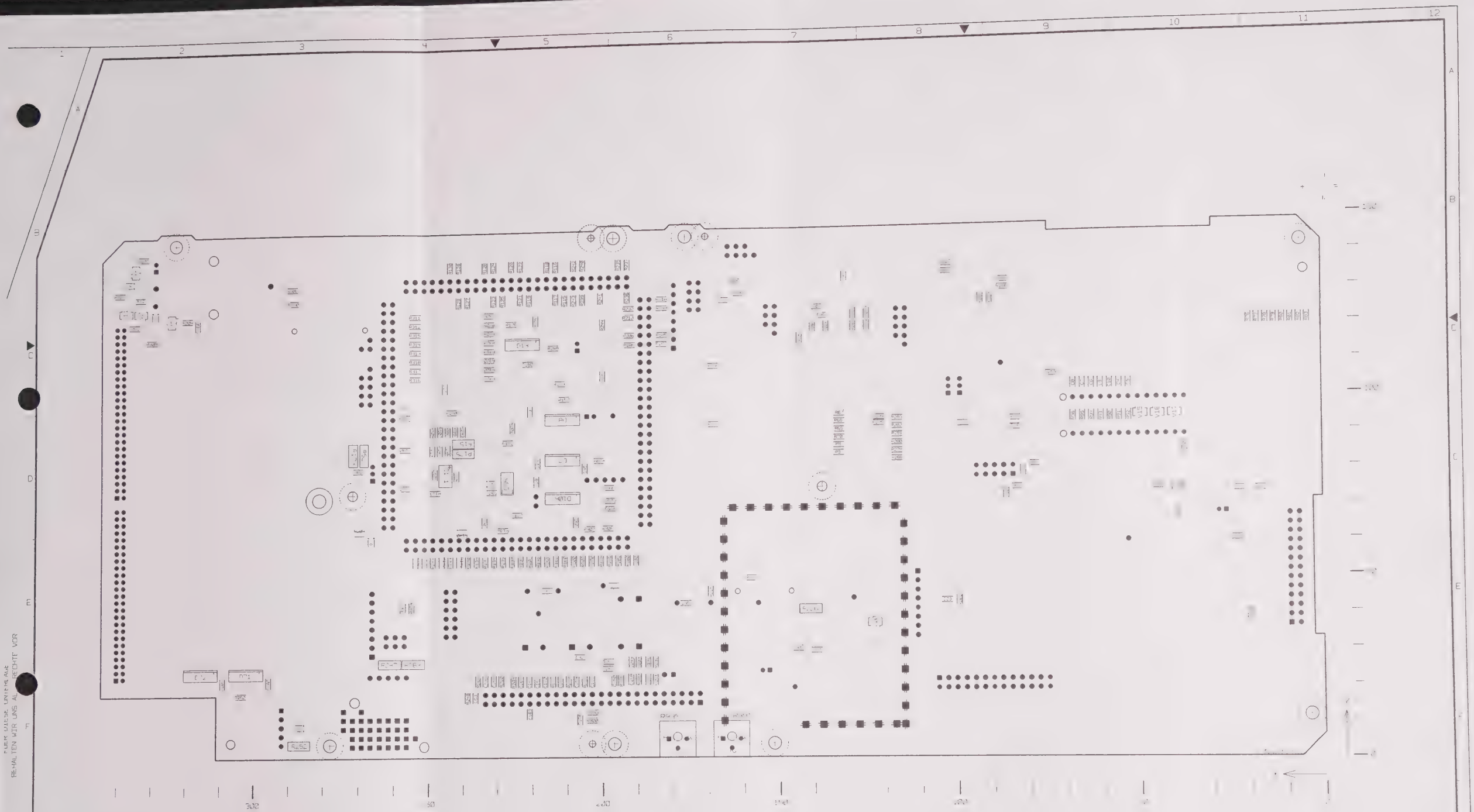
BLATT-NR 3 +

REG.I.V. 1084.8004

PRINTED 1084.8004.01

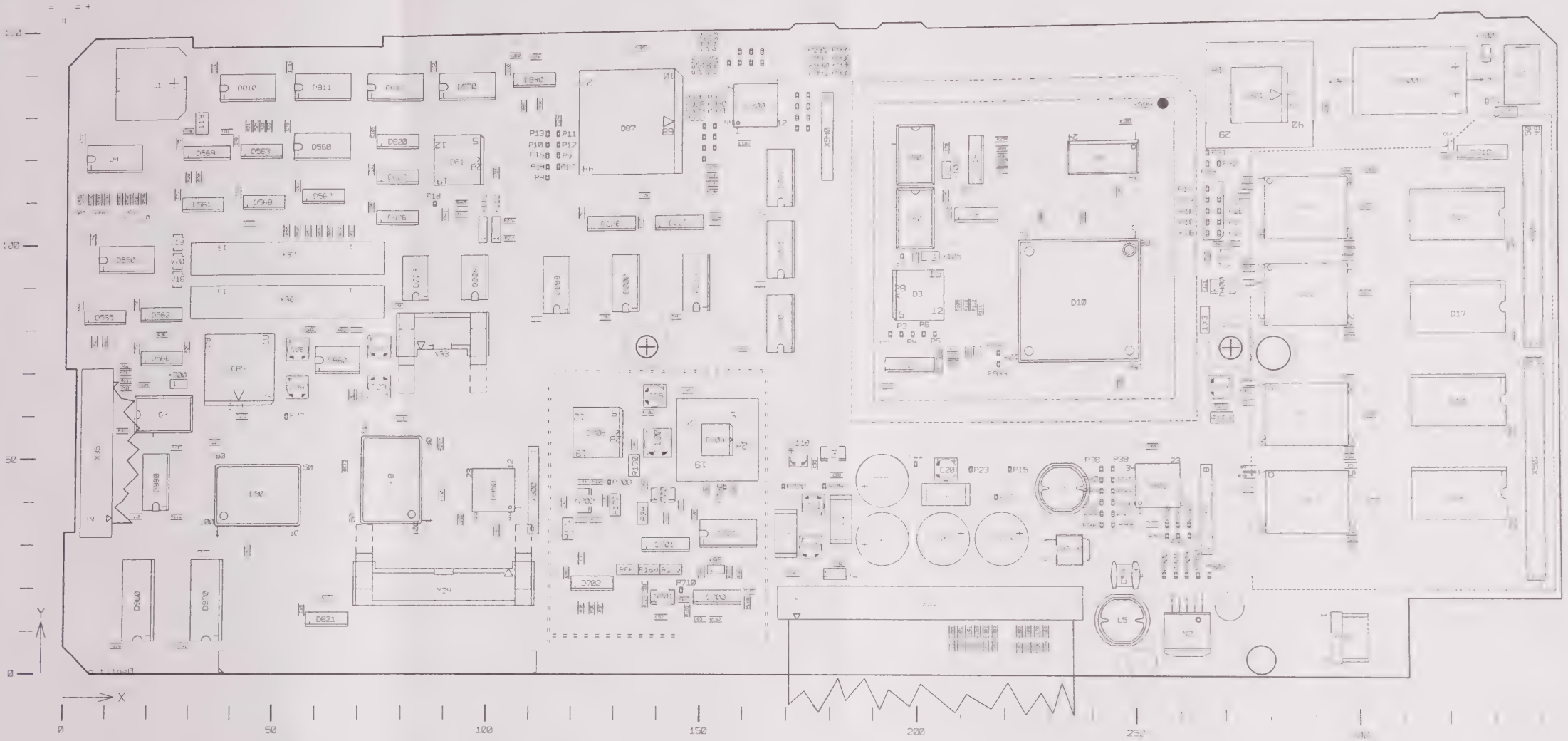
ÜBERTRAGUNG SOWIE VERVIELFÄLTIGUNG DIESER UNTERLAGE, VERWERTUNG UND MITTEILUNG IHRES INHALTS NICHT GESTATTET, SOWEIT NICHT AUSDRÜCKLICH ZUGESTANDEN. ZUWIDERHANDLUNGEN VERPFLICHTEN ZU SCHADENERSATZ. ALLE RECHTE VOR BEHALTEN WIR UNS ALLE RE


P6, P5, P4, P3, P2
CLOCK GENERATOR
CLKGEN
R249
10K
D14
74ACT163SC
CTR4
R254
10K
X106
02ST
+5V
R244
1K
100N
G50
50MHZ
VDD
OE OUT
GND
R75
10K
D13
74ACT32M
R351
CLKCPU-PERI
(18/1B)
CLKCPI
(3/2D,7/2C,9/5B,10/1A,10/5A)
LCD-MPUCLK
(18/4A)
R174
R88
L5A8666
TEST3
TESTOUT
TRISTAT1
FCPUIN
1K
CLK2XB
2MHZ
1KHZ
200HZ
CLK-IE
C179
G40
40MHZ
R245
RESET GENERATOR
UBRESET
(7/4B)
R255
R264
10
BAS216
74HC132
R256
10K
R267
R265
C55
D15
MAX793TCSE
C65
100N
+3.3V
VCC
BATTON
GND
OUT
BATT
MR
RESET
PFI
PFO
WDI
WDO
LOWLINE
BATTOK
CEI
R259
BATTON
(8/2A)
4.7K
+3,3V
R247
P901
R263
L5
P900
C56
C37
C131
C180
D3
74ACT163SC
D13
74ACT32M
R257
AENDERUNGS-
MITTEILUNG
BE-RE
NORM
DATUM
NAME



DARSTELLUNG SEITE A
VIEW ON SIDE A

AEND. IND.	AENDERUNGS MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ	BENENNUNG RECHNER_(FC) CPU_(FC)
					ZEICHN.-NR. 1084.8504.01 D
					BLATT 2-



DARSTELLUNG SEITE B
VIEW ON SIDE B

ACHTUNG: ESD!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN BESONDERE HANDHABUNG.
ATTENTION ESD!
ELECTROSTATIC SENSITIVE DEVICE REQUIRE A SPECIAL HANDLING

NICHT BESTUECKTE BAUTEILE
NONFITTED COMPONENTS

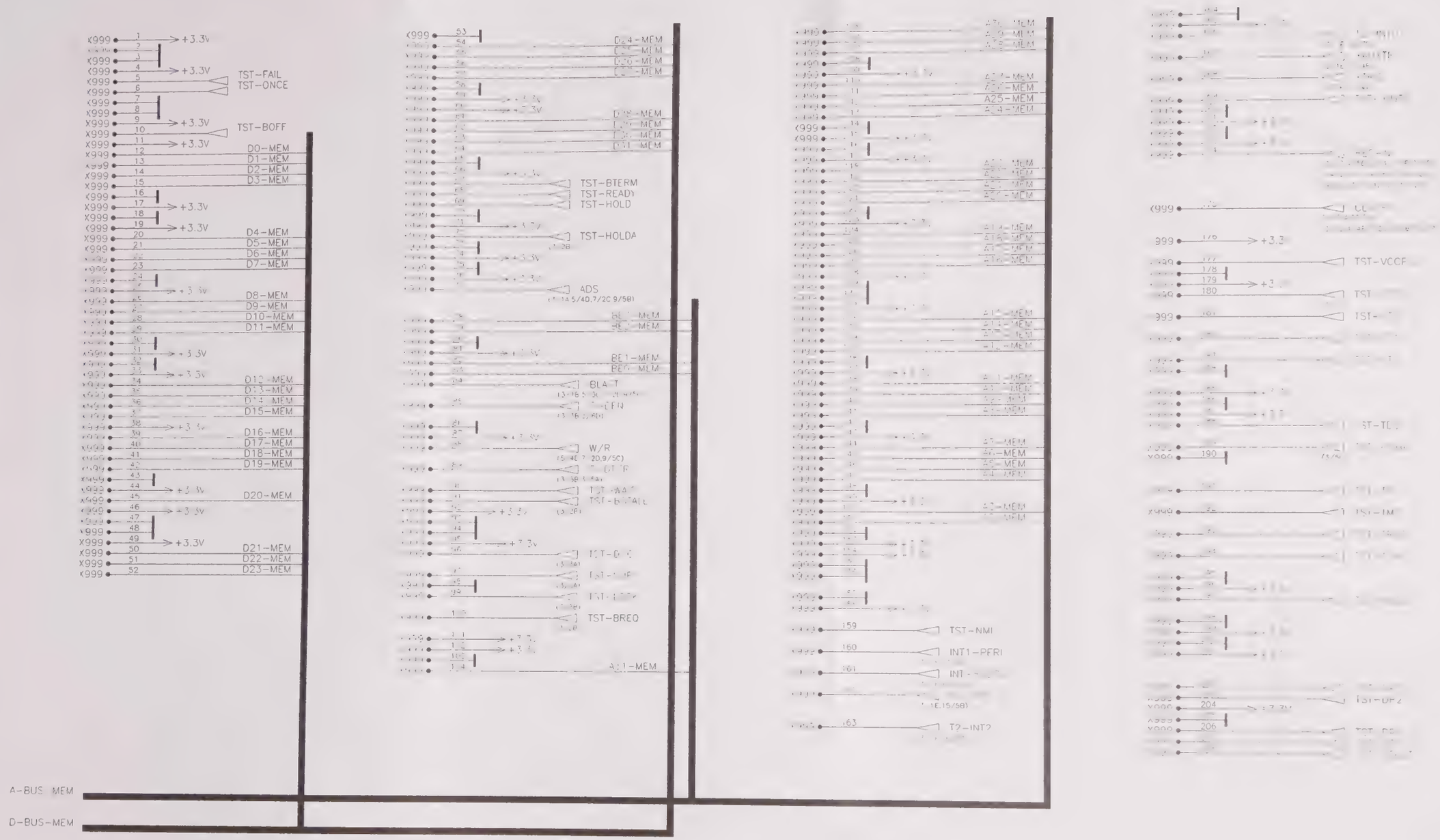
ROHDE&SCHWARZ

BENENNUNG
RECHNER_(FC)
CPU_(FC)

ZEICHN.-NR.
1084.8504.01 D

BLATT-NR. 1+

1084 8004

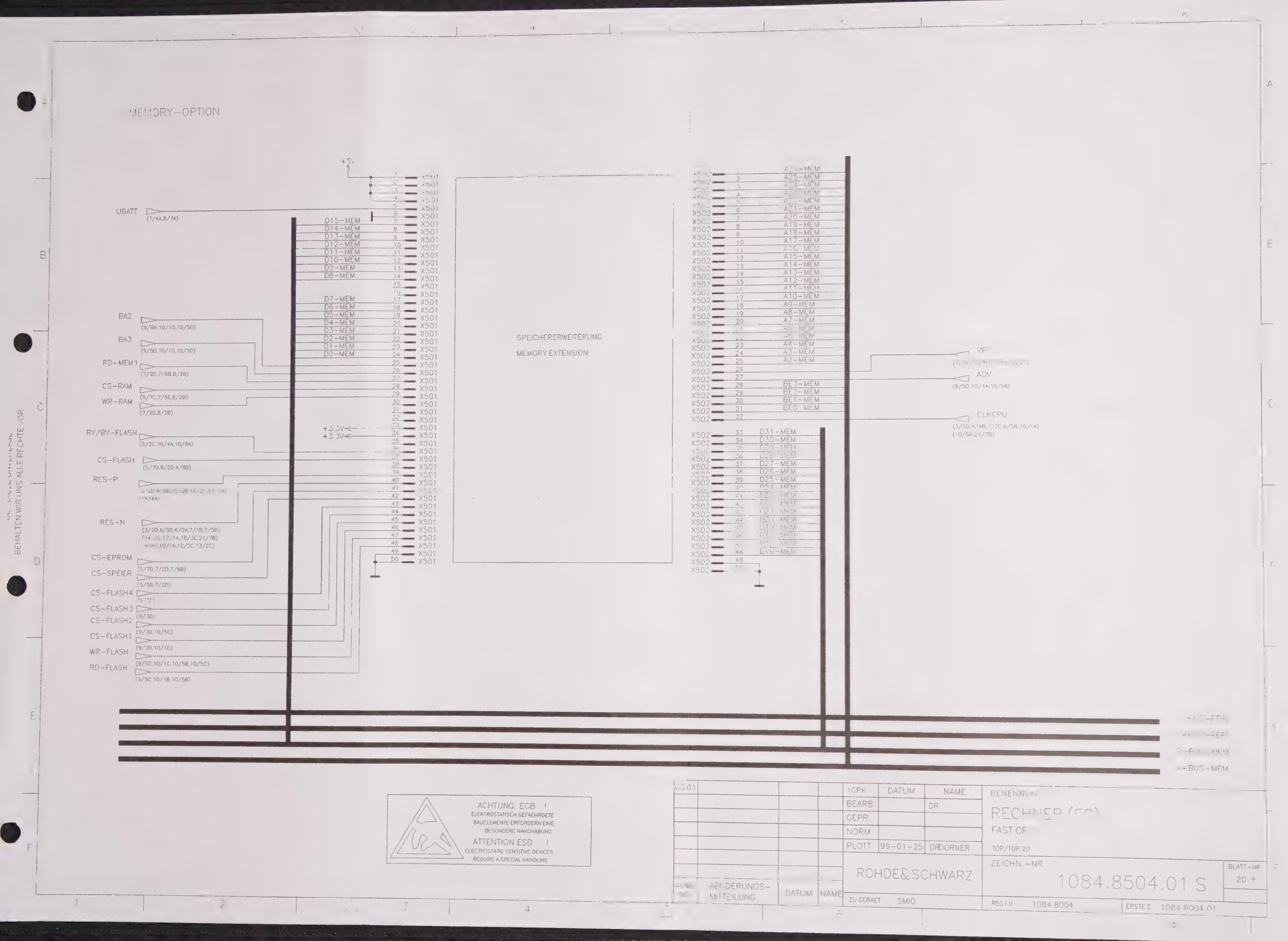


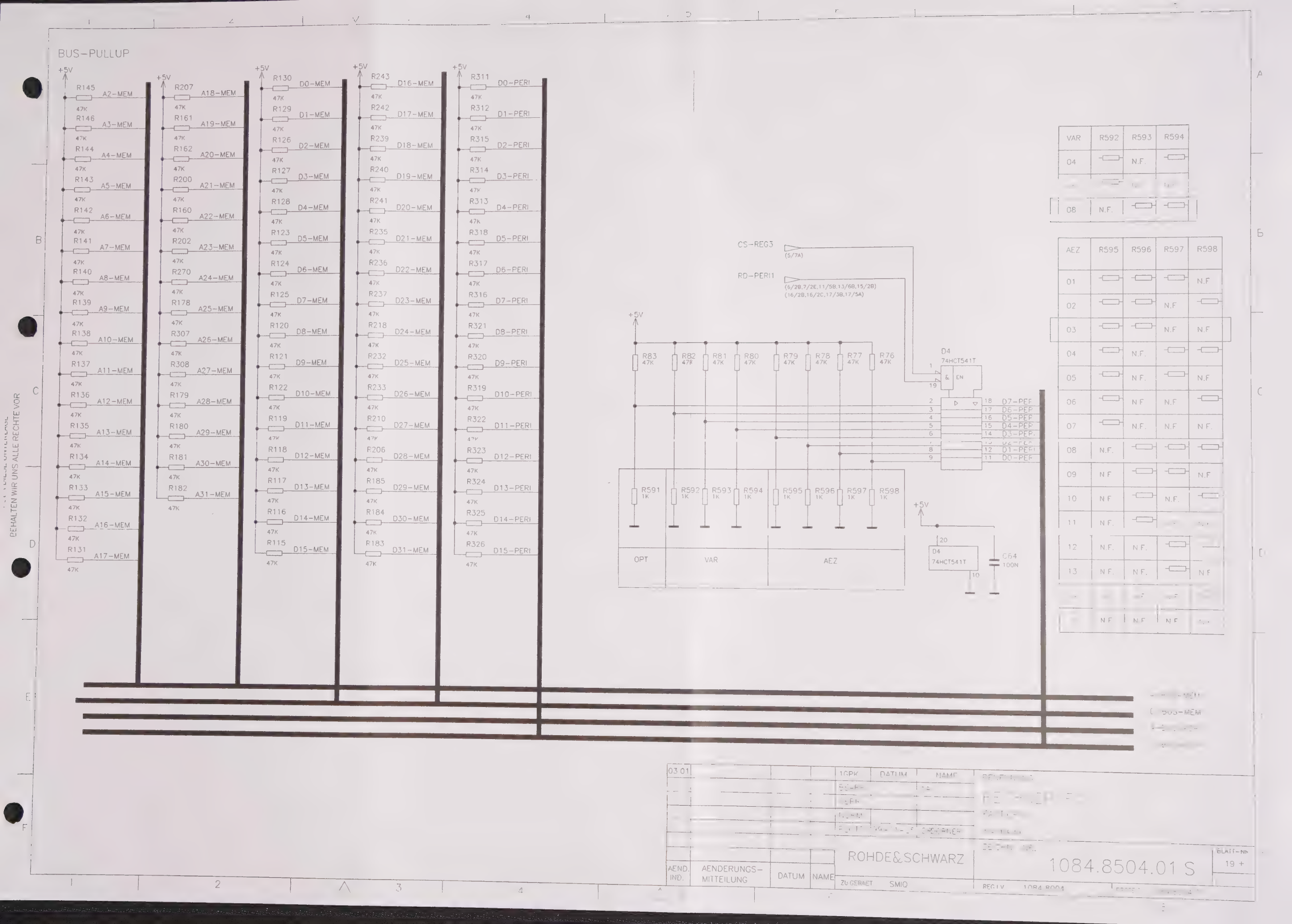
BEHALTEN WIR UNS ALLE RECHTE VOR

ACHTUNG EGB !
ELEKTROSTATISCH GEFAEHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG
ATTENTION ESD !
ELECTROSTATIC SENSITIVE DEVICES
REQUIRE A SPECIAL HANDLING

03.01				1GPK	DATUM	NAME	BENENNUNG
				GEPR		DP	RECHNER (FC
AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ			1084
				ZU GERAET SMIQ			REG.I.V. 1084 8004

BLATT-NR


MEMORY-OPTION
+5V
UBATT
(7/4A,8/7A)
BA2
(9/5D,10/1D,10/5D)
BA3
(9/5D,10/1D,10/5D)
RD-MEM1
(7/2D,7/6B,8/2B)
CS-RAM
(5/7C,7/5E,8/2B)
WR-RAM
(7/2D,8/2B)
RY/BY-FLASH
(6/2C,10/4A,10/8A)
CS-FLASH
(5/7D,9/2D,9/8D)
RES-P
RES-N
(3/2D,4/5D,6/2A,7/1B,7/5D)
CS-EPROM
(5/7D,7/2D,7/6B)
CS-SPEIER
(5/5B,7/2D)
CS-FLASH4
CS-FLASH3
(9/3D)
CS-FLASH2
(9/3D,10/5C)
CS-FLASH1
(9/3D,10/1C)
WR-FLASH
(9/5C,10/1C,10/5B,10/5C)
RD-FLASH
(3/5C,10/1B,10/5B)
D15-MEM
D14-MEM
D13-MEM
D12-MEM
D11-MEM
D10-MEM
D9-MEM
D8-MEM
D7-MEM
D6-MEM
D5-MEM
D4-MEM
D3-MEM
D2-MEM
D1-MEM
D0-MEM
+3.3V
+3.3V
X501
SPEICHERERWEITERUNG
MEMORY EXTENSION
X502
A25-MEM
A21-MEM
A20-MEM
A19-MEM
A18-MEM
A17-MEM
A15-MEM
A14-MEM
A13-MEM
A12-MEM
A10-MEM
A9-MEM
A8-MEM
A7-MEM
A4-MEM
A3-MEM
A2-MEM
BE3-MEM
BE2-MEM
BE1-MEM
BE0-MEM
D31-MEM
D30-MEM
D27-MEM
D26-MEM
D25-MEM
D16-MEM
ADV
(9/5D,10/1A,10/5A)
CLKCPU
(3/2D,4/4B,7/2C,9/5B,10/1A)
(10/5A,21/7B)
-BUS-MEM
ACHTUNG: EGB !
ELEKTROSTATISCH GEFAEHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG
ATTENTION ESD !
ELECTROSTATIC SENSITIVE DEVICES
REQUIRE A SPECIAL HANDLING
1GPK
DATUM
NAME
BEARB.
DR
GEPR.
NORM
PLOTT
99-01-25
DRDORNER
BENENNUNG
RECHNER (EC)
FAST CF
TOP/TOP.20
ROHDE&SCHWARZ
ZEICHN.-NR.
1084.8504.01 S
BLATT-NR
20 +
AENDERUNGS-
MITTEILUNG
DATUM
NAME
ZU GERAET
SMIQ
REG.I.V.
1084.8004
ERSTE Z.
1084.8004.01


BUS-PULLUP
+5V
R145 A2-MEM 47K
R146 A3-MEM 47K
R144 A4-MEM 47K
R143 A5-MEM 47K
R142 A6-MEM 47K
R141 A7-MEM 47K
R140 A8-MEM 47K
R139 A9-MEM 47K
R138 A10-MEM 47K
R137 A11-MEM 47K
R136 A12-MEM 47K
R135 A13-MEM 47K
R134 A14-MEM 47K
R133 A15-MEM 47K
R132 A16-MEM 47K
R131 A17-MEM 47K
R207 A18-MEM 47K
R161 A19-MEM 47K
R162 A20-MEM 47K
R200 A21-MEM 47K
R160 A22-MEM 47K
R202 A23-MEM 47K
R270 A24-MEM 47K
R178 A25-MEM 47K
R307 A26-MEM 47K
R308 A27-MEM 47K
R179 A28-MEM 47K
R180 A29-MEM 47K
R181 A30-MEM 47K
R182 A31-MEM 47K
R130 D0-MEM 47K
R129 D1-MEM 47K
R126 D2-MEM 47K
R127 D3-MEM 47K
R128 D4-MEM 47K
R123 D5-MEM 47K
R124 D6-MEM 47K
R125 D7-MEM 47K
R120 D8-MEM 47K
R121 D9-MEM 47K
R122 D10-MEM 47K
R119 D11-MEM 47K
R118 D12-MEM 47K
R117 D13-MEM 47K
R116 D14-MEM 47K
R115 D15-MEM 47K
R243 D16-MEM 47K
R242 D17-MEM 47K
R239 D18-MEM 47K
R240 D19-MEM 47K
R241 D20-MEM 47K
R235 D21-MEM 47K
R236 D22-MEM 47K
R237 D23-MEM 47K
R218 D24-MEM 47K
R232 D25-MEM 47K
R233 D26-MEM 47K
R210 D27-MEM 47K
R206 D28-MEM 47K
R185 D29-MEM 47K
R184 D30-MEM 47K
R183 D31-MEM 47K
R311 D0-PERI 47K
R312 D1-PERI 47K
R315 D2-PERI 47K
R314 D3-PERI 47K
R313 D4-PERI 47K
R318 D5-PERI 47K
R317 D6-PERI 47K
R316 D7-PERI 47K
R321 D8-PERI 47K
R320 D9-PERI 47K
R319 D10-PERI 47K
R322 D11-PERI 47K
R323 D12-PERI 47K
R324 D13-PERI 47K
R325 D14-PERI 47K
R326 D15-PERI 47K
CS-REG3
(5/7A)
RD-PERI1
(6/2B,7/2E,11/5B,13/6B,15/2B)
(16/2B,16/2C,17/3B,17/5A)
R83 47K
R82 47K
R81 47K
R80 47K
R79 47K
R78 47K
R77 47K
R76 47K
D4
74HCT541T
EN
D7-PER
D6-PER
D5-PER
D4-PER
D3-PER
D1-PER
D0-PER
R591 1K
R592 1K
R593 1K
R594 1K
R595 1K
R596 1K
R597 1K
R598 1K
OPT
VAR
AEZ
D4
74HCT541T
C64
100N
VAR R592 R593 R594
04 N.F.
08 N.F.
AEZ R595 R596 R597 R598
01 N.F
02 N.F
03 N.F N.F
04 N.F.
05 N.F. N.F
06 N.F N.F
07 N.F. N.F N.F.
08 N.F.
09 N.F N.F
10 N.F N.F.
11 N.F.
12 N.F. N.F.
13 N.F. N.F. N.F
N.F N.F N.F
BEHALTEN WIR UNS ALLE RECHTE VOR
03.01
1GPK DATUM NAME
AEND. IND.
AENDERUNGS-MITTEILUNG
DATUM
NAME
ROHDE&SCHWARZ
ZU GERAET SMIQ
1084.8504.01 S
BLATT-NR 19 +
REG.I.V. 1084.8004

LCD-CONTROLLER

X902 X902 X902 X902 X902 X902 X902

EN (7/2C,9/5B)
SCLK_Y2 (7/2C,9/5B)
MODE_IN2 (7/2C,9/5B)
C23 10N
R261 10K
CLKCPU-PERI (4/5B)
R262 10K +5V

D950
ISPLSI1016-60LT

EN
IN3
Y0
Y1_/RESET
SCLK_Y2
MODE_IN2
SDI_IN0
IN1_SDO

ADS-PERI (5/5D)
A25-PERI
W/R-PERI (5/5D)
BLAST-PERI (5/5C)
RDY-PERILCD (3/1B)

IO0 IO1 IO2 IO3 IO4 IO5 IO6 IO7 IO8 IO9 IO10 IO11 IO12 IO13 IO14 IO15
IO16 IO17 IO18 IO19 IO20 IO21 IO22 IO23 IO24 IO25 IO26 IO27 IO28 IO29 IO30 IO31

SD300 (7/2C)
LCD-IOCS (18/4A)
LCD-MEMCS (18/4A)
LCD-WR (18/4A)
LCD-RD (18/4A)
RDY-LCD (18/8A)
RES-N (3/2D,4/5D,6/2A,7/1B,7/5D) (14/2C,17/1A,20/2D,21/7B) (9/8C,10/1A,12/2C,13/2C)

+5V C181 100N
VCC VCC GND GND
CS-LCD (5/5B)

RES-P (2/2D,4/5D,15/2B,16/2C,17/5A)
+5V R48 10K
LCD-MPUCLK (4/4B)
LCD-IOCS (18/3B)
LCD-MEMCS (18/3B)
LCD-WR (18/3C)
LCD-RD (18/3C)

SED1351F0A
RESET
MPUCLK
IOCS
IOWR
IORD
MEMCS
MEMWR
MEMRD

2MHZ (4/8B)
OSC1
OSC2

BHE-PERI BLE-PERI A1-PERI A2-PERI A3-PERI A4-PERI A5-PERI A6-PERI A7-PERI A8-PERI A9-PERI A10-PERI A11-PERI A12-PERI A13-PERI A14-PERI A15-PERI
BHE AB0 AB1 AB2 AB3 AB4 AB5 AB6 AB7 AB8 AB9 AB10 AB11 AB12 AB13 AB14 AB15

D7-PERI D6-PERI D5-PERI D4-PERI D3-PERI D2-PERI D1-PERI D0-PERI D15-PERI D14-PERI D13-PERI D12-PERI D11-PERI D10-PERI D9-PERI D8-PERI
DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0 DB15 DB14 DB13 DB12 DB11 DB10 DB9 DB8

READY

VA1 VA2 VA3 VA4 VA5 VA6 VA7 VA8 VA9 VA10 VA11 VA12 VA13 VA14 VA15

VD0 VD1 VD2 VD3 VD4 VD5 VD6 VD7 VD8 VD9 VD10 VD11 VD12 VD13 VD14 VD15

VCS0 VCS1 VCS2 VCS3 VCS4 VWE UD0 UD1 UD2 UD3 LD0 LD1 LD2 LD3 LCDENB

VIDEOBUS-ADR

D970
CE WE OE
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14
I/O1 I/O2 I/O3 I/O4 I/O5 I/O6 I/O7 I/O8
VD0 VD1 VD2 VD3 VD4 VD5 VD6 VD7

VIDEOBUS

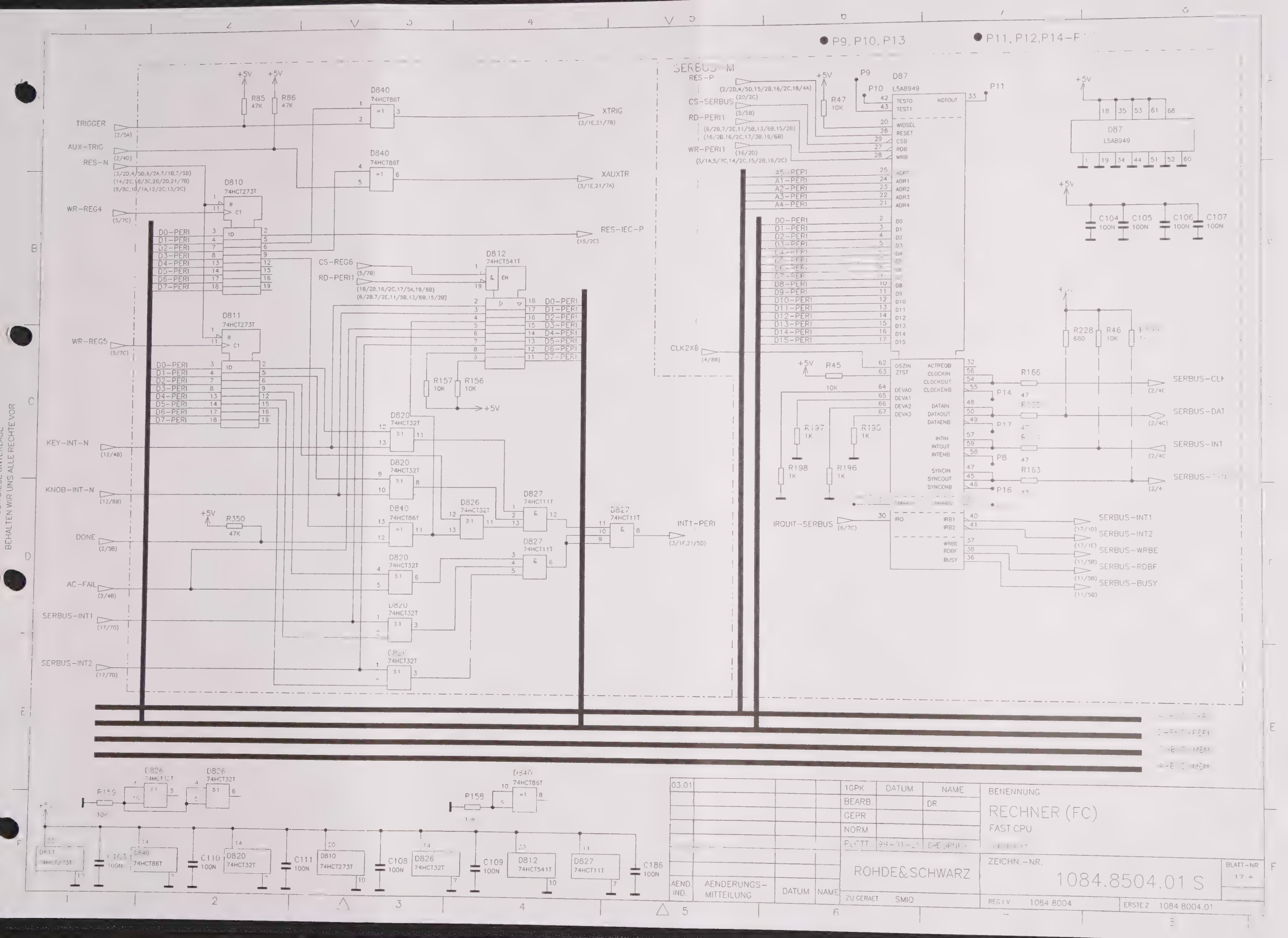
D960
74HCT541T
LCD-E (2/7D)
LCD-D1 (2/7D)
LCD-D2 (2/7D)
LCD-D3 (2/7C)
LCD-CP2 (2/7D)
LCD-CP1 (2/7D)

+5V
C117 100N
D90 SED1351F0A
C114 100N
D980 74HCT541T
C115 100N
D960 TC55257AFL-1
C116 100N
D970 TC55257AFL-1
C112 100N

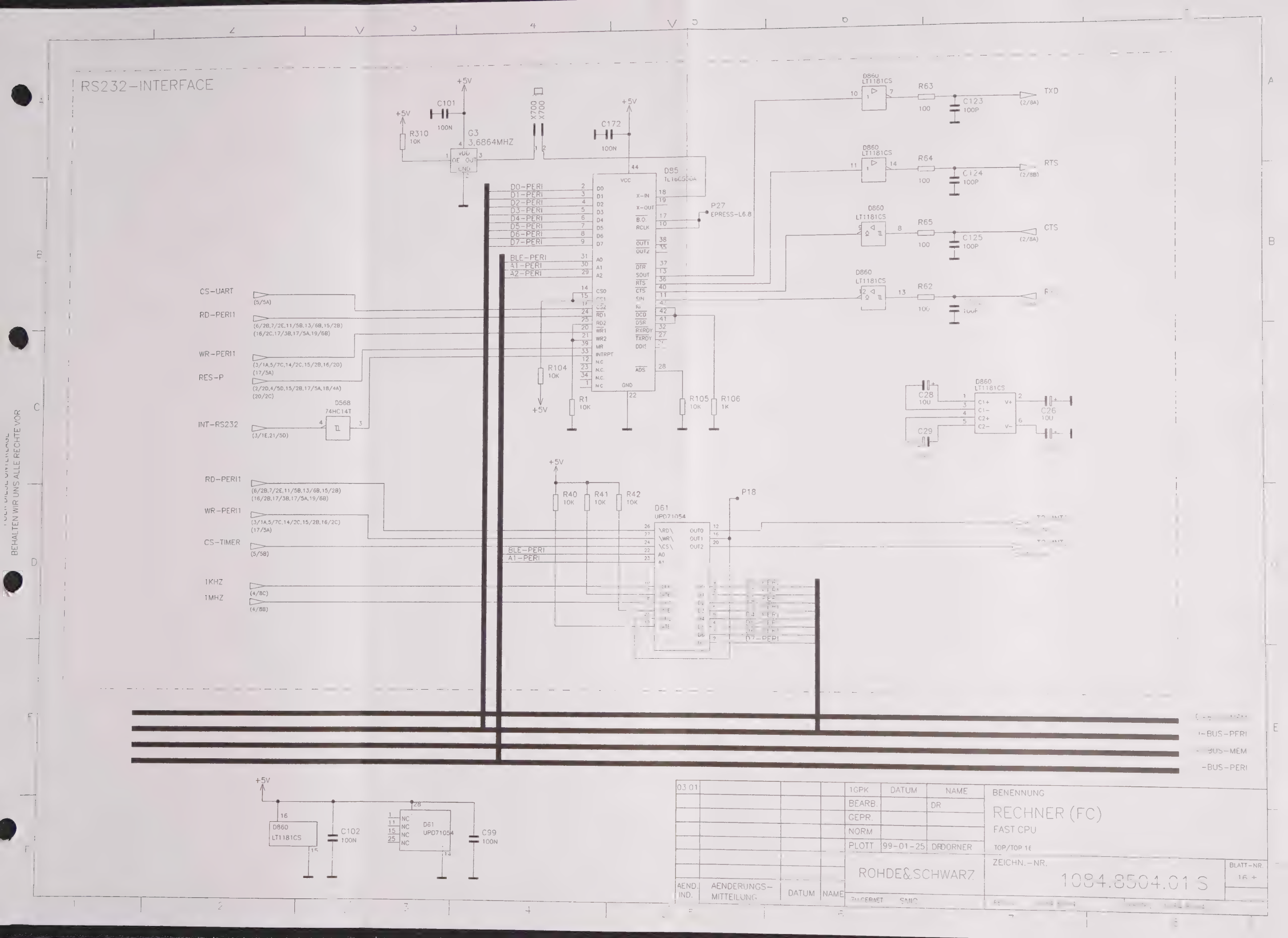
03.01				1GPK	DATUM	NAME	BENENNUNG
				BEARB.		DR	RECHNER (FC)
				GEPR.			FAST CPU
				NORM			TOP/TOP 18
				PLOTT	99-01-25	DRDORNER	ZEICHN.-NR.
AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ			1084.8504.01 S
				ZU GERAET SMIQ			REG.TY 1084 8004
							ERSTE Z. 1084 8004.01

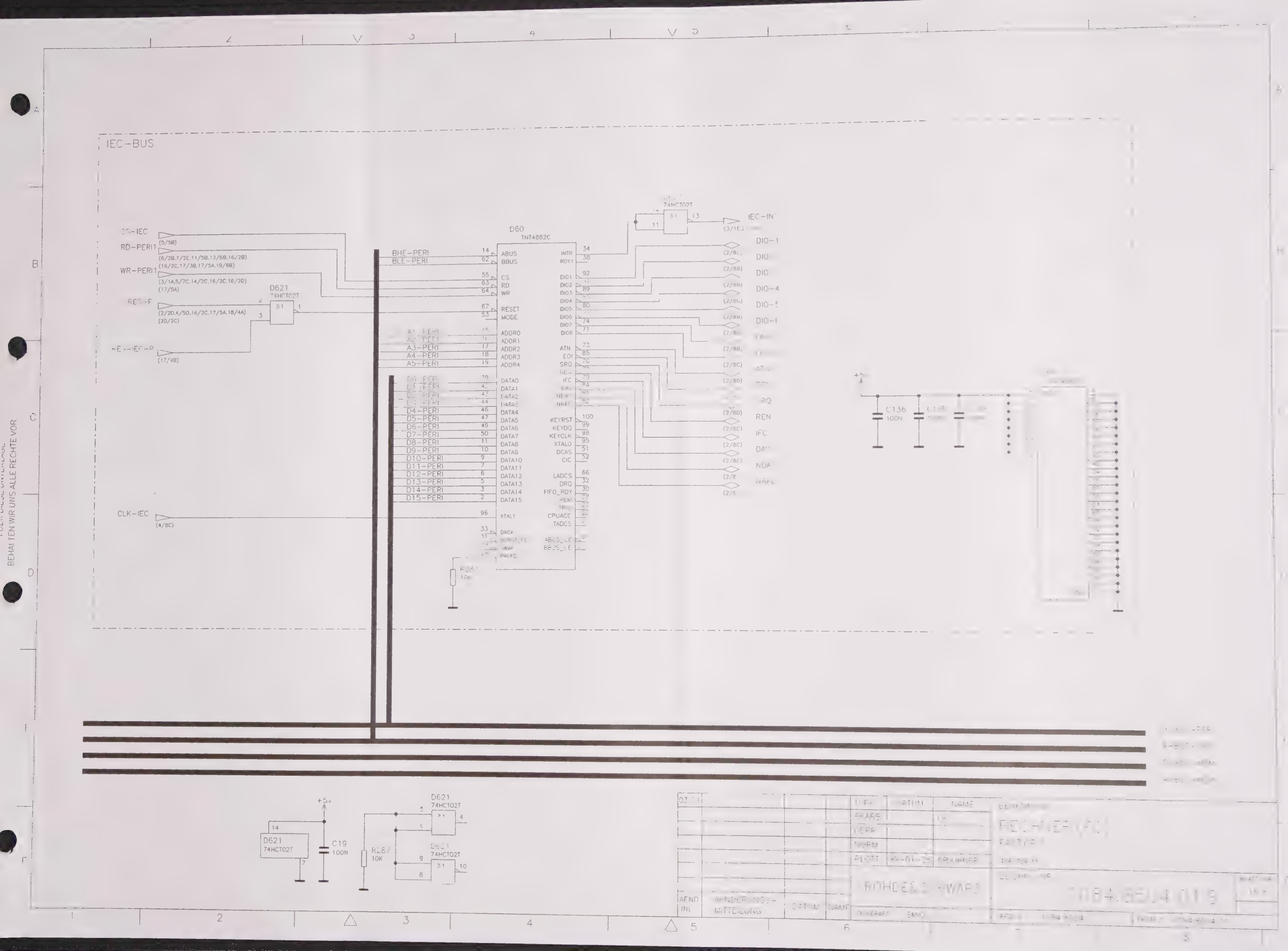
BLATT-NR 18 +

BEHALTEN WIR UNS ALLE RECHTE VOR



P9, P10, P13
P11, P12, P14-P
SERBUS-M
TRIGGER
AUX-TRIG
RES-N
WR-REG4
WR-REG5
KEY-INT-N
KNOB-INT-N
DONE
AC-FAIL
SERBUS-INT1
SERBUS-INT2
XTRIG
XAUXTR
RES-IEC-P
CS-REG6
RD-PERI1
RES-P
CS-SERBUS
WR-PERI1
CLK2XB
INT1-PERI
IRQUIT-SERBUS
SERBUS-CLK
SERBUS-DAT
SERBUS-INT
SERBUS-INT1
SERBUS-INT2
SERBUS-WRBE
SERBUS-RDBF
SERBUS-BUSY
D840 74HCT86T
D810 74HCT273T
D811 74HCT273T
D812 74HCT541T
D820 74HCT32T
D826 74HCT32T
D827 74HCT11T
D87 L5A8949
R85 47K
R86 47K
R350 47K
R157 10K
R156 10K
R47 10K
R45 10K
R197 1K
R195 1K
R198 1K
R196 1K
R228 680
R46 10K
R166 47
R163 47
C104 100N
C105 100N
C106 100N
C107 100N
C110 100N
C111 100N
C108 100N
C109 100N
C186 100N
BEHALTEN WIR UNS ALLE RECHTE VOR
03.01
1GPK
DATUM
NAME
BEARB.
DR
GEPR
NORM
PLOTT
AEND. IND.
AENDERUNGS-MITTEILUNG
DATUM
NAME
BENENNUNG
RECHNER (FC)
FAST CPU
ROHDE&SCHWARZ
ZEICHN.-NR.
1084.8504.01 S
BLATT-NR
ZU GERAET SMIO
REG I V 1084 8004
ERSTE Z 1084 8004.01


RS232-INTERFACE
+5V
C101
100N
R310
10K
G3
3,6864MHZ
X700
X700
C172
100N
D85
TL16C550A
P27
EPRESS-L6.8
D0-PERI
D1-PERI
D2-PERI
D3-PERI
D4-PERI
D5-PERI
D6-PERI
D7-PERI
BLE-PERI
A1-PERI
A2-PERI
CS-UART
RD-PERI1
WR-PERI1
RES-P
INT-RS232
D568
74HC14T
R104
10K
R1
10K
R105
10K
R106
1K
D860
LT1181CS
R63
100
C123
100P
TXD
R64
100
C124
100P
RTS
R65
100
C125
100P
CTS
R62
100
C28
10U
C29
C26
10U
RD-PERI1
WR-PERI1
CS-TIMER
1KHZ
1MHZ
R40
10K
R41
10K
R42
10K
D61
UPD71054
P18
D7-PERI
-BUS-PERI
-BUS-MEM
-BUS-PERI
C102
100N
C99
100N
BEHALTEN WIR UNS ALLE RECHTE VOR
03.01
1GPK
DATUM
NAME
BEARB.
DR
GEPR.
NORM
PLOTT
99-01-25
DRDORNER
BENENNUNG
RECHNER (FC)
FAST CPU
TOP/TOP 16
ROHDE&SCHWARZ
ZEICHN.-NR.
1084.8504.01 S
BLATT-NR.
16 +
AEND. IND.
AENDERUNGS-MITTEILUNG
DATUM
NAME


IEC-BUS
D60
TNT4882C
D621
74HCT02T
RD-PERI1
WR-PERI1
CLK-IEC
BHE-PERI
BLE-PERI
A3-PERI
A4-PERI
A5-PERI
D4-PERI
D5-PERI
D6-PERI
D7-PERI
D8-PERI
D9-PERI
D10-PERI
D11-PERI
D12-PERI
D13-PERI
D14-PERI
D15-PERI
ABUS
BBUS
CS
RD
WR
RESET
MODE
ADDR0
ADDR1
ADDR2
ADDR3
ADDR4
DATA0
DATA1
DATA4
DATA5
DATA6
DATA7
DATA8
DATA9
DATA10
DATA11
DATA12
DATA13
DATA14
DATA15
XTAL1
DACK
INTR
RDY1
DIO1
DIO2
DIO3
DIO4
DIO5
DIO6
DIO7
DIO8
ATN
EOI
SRQ
IFC
KEYRST
KEYDQ
KEYCLK
XTALO
DCAS
CIC
LADCS
DRQ
FIFO_RDY
CPUACC
TADCS
IEC-IN
DIO-1
DIO-4
REN
IFC
C136
100N
+5V
C19
100N
R287
10K
AEND
INC
ROHDE&SCHWARZ
SMIQ

<-OUTPUT

+5V

R37 10K

R36 10K

R35 10K

D702
74ACT20M

UREF-D/A

C95
100N

WR-PER11

RES-N

(5/5B)

(2D,4/5D,6/2A,7/1B,7/5D)
(17/1A,18/3C,20/2D,21/7B)
(9/8C,10/1A,12/2C,13/2C)

DA0 REFOUT
DB1
DB2 ROFS
DB3
DB4 RFB
DB5
DB6 VOUT
DB7 NC
DB8 NC
DB9 NC
DB10 NC
DB11 AGND

D0-PER1
D1-PER
D2-PER
D3-PER
D4-PER
D5-PER
D6-PER
D7-PER
D8-PER
D9-PER
D10-PER
D11-PER

C96
100N

+15V

R171

+15V R170

C34
100N

D706
AD7245JP

VDD
DGND

AENDERUNGS-
MITTEILUNG

DATUM NAME

GEZ. DATUM NAME

GEARB DP

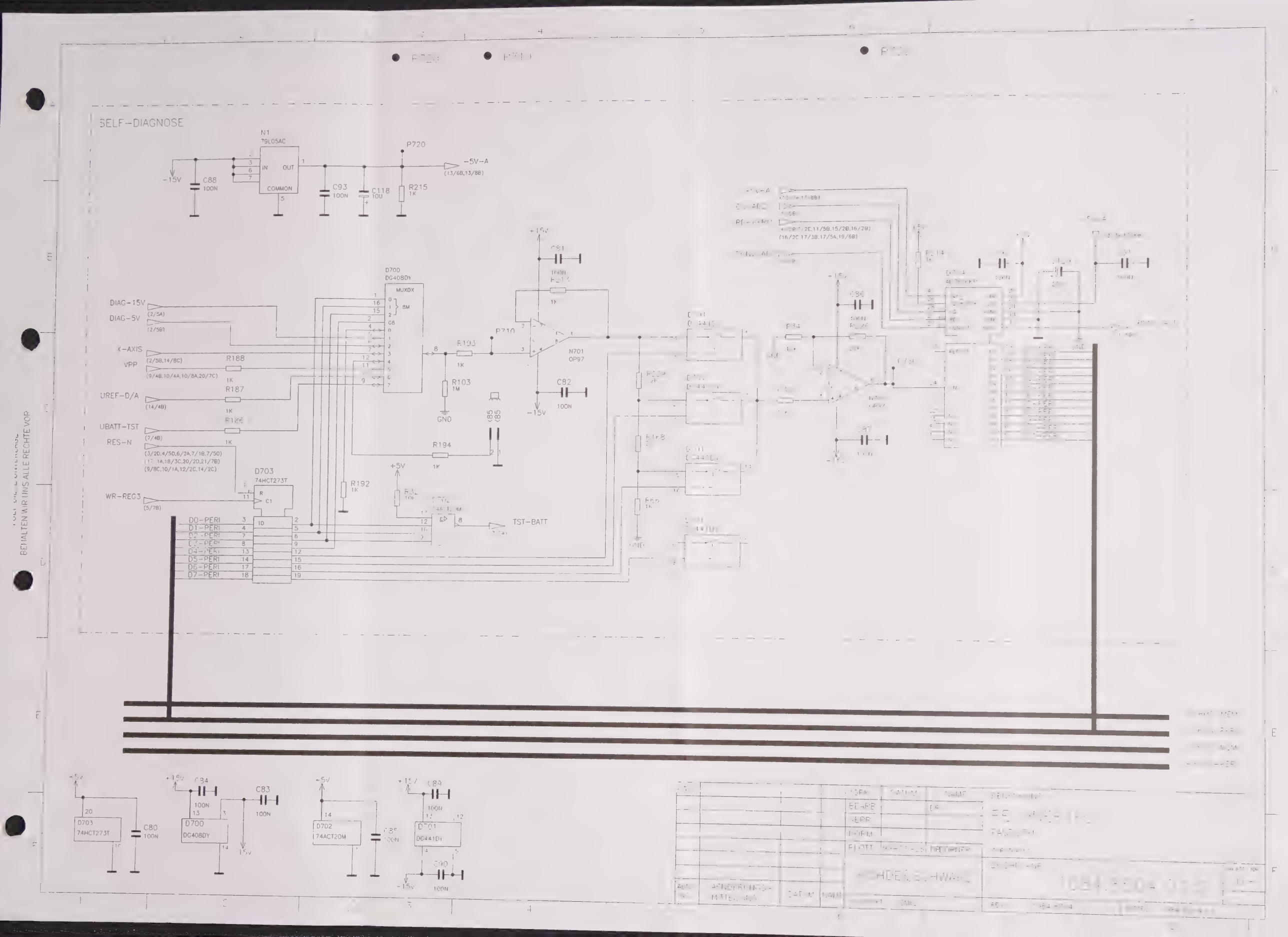
GEPR

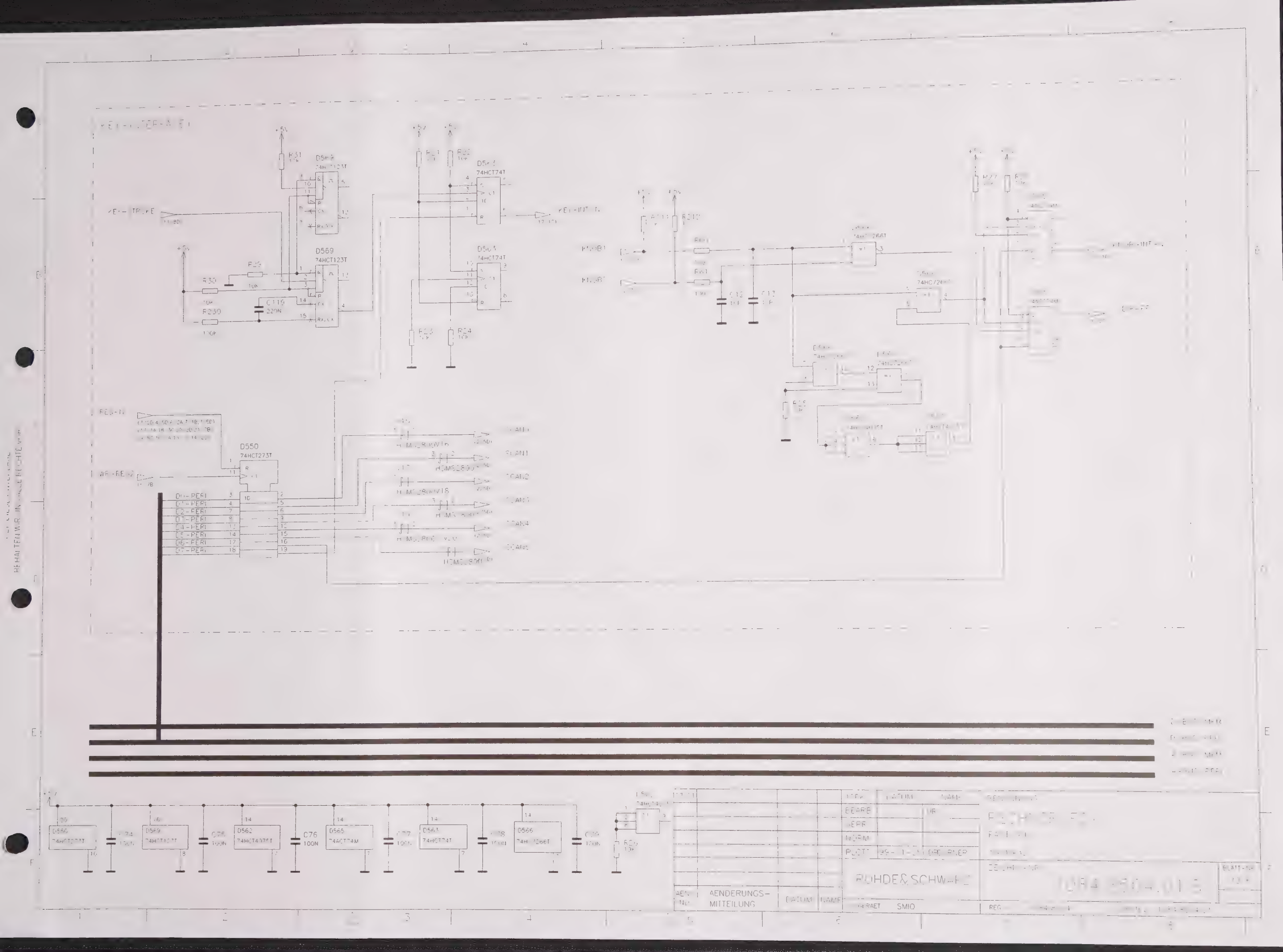
NORM

FREIGEB 04.11.85 PREISINGER

BLATT-NR 14

BEHALTEN WIR UNS ALLE RECHTE VOR


SELF-DIAGNOSE
N1
79L05AC
IN
OUT
COMMON
-15V
C88
100N
C93
100N
C118
10U
P720
R215
1K
-5V-A
(13/6B,13/8B)
D700
DG408DY
MUXDX
8M
DIAG-15V
DIAG-5V
(2/5A)
(2/5B)
X-AXIS
VPP
(2/5B,14/8C)
(9/4B,10/4A,10/8A,20/7C)
R188
1K
UREF-D/A
(14/4B)
R187
1K
UBATT-TST
RES-N
(7/4B)
(3/2D,4/5D,6/2A,7/1B,7/5D)
(9/8C,10/1A,12/2C,14/2C)
WR-REG3
(5/7B)
D703
74HCT273T
D0-PERI
D1-PERI
D2-PERI
D3-PERI
D4-PERI
D5-PERI
D6-PERI
D7-PERI
R193
1K
R103
1M
GND
P710
N701
OP97
C82
100N
R194
1K
R192
1K
+5V
TST-BATT
+15V
-15V
C80
100N
C84
100N
C83
100N
D702
74ACT20M
C89
100N
D701
DG441DY
C90
100N
BEHALTEN WIR UNS ALLE RECHTE VOR



D569
74HCT123T
D563
74HCT74T
D550
74HCT273T
D562
74HCT4075T
D565
74ACT74M
D566
74HC7266T
C76
100N
C119
220N
R30
R230
R29
R31
R24
R23
R22
R21
R27
R25
R26
D0-PERI
D1-PERI
D2-PERI
D3-PERI
D4-PERI
D5-PERI
D6-PERI
D7-PERI
SCAN1
SCAN2
SCAN3
SCAN4
SCAN5
KEY-INTERFACE
KEY-STROKE
KEY-INT
KNOB1
KNOB2
+5V
REHALTEN WIR UNSERE RECHTE VOR
AENDERUNGS-
MITTEILUNG
DATUM
NAME
ROHDE&SCHWARZ
SMIO

BEHALTEN WIR UNS ALLE RECHTE VOR

KEY-INTERFACE

+5V

R44 10K
R45 10K
R46 10K
R90 10K
R91 10K
R92 10K
R93 10K
C1 10P
C2 10P
C3 10P
C10 10P
C4 10P
C5 10P

RET0 (2,5V)
RET1 (2,5V)
RET2 (2,5V)
RET3 (2,5V)
RET4 (2,5V)
RET5 (2,5V)
RET6 (2,5V)

R53 100
R54 100
R55 100
R56 100
R57 100
R58 100
R59 100

D567 74HC14T
D567 74HC14T
D567 74HC14T
D567 74HC14T
D567 74HC14T
D567 74HC14T
D568 74HC14T

-RD74
RD-RD11
BUSY-A/D
SERBUS-WRBE
SERBUS-RDBF
SERBUS-BUSY
CS-REG5

D570 74HCT541T

D569 74HC14T
D570 74HCT541T
D561 74HCT4075T
D569 74HC14T
D560 74HCT541T

C69 100N
C70 100N
C71 100N
C72 100N
C73 100N

			REV	DATUM	NAME
			PRÜFE		
			GEPR		
			NORM		
			PLOTT	94-01-25	DAENIKER
ÄEN-DER	ÄENDERUNG / MITTEILUNG	DATUM	NAME	ZUSTAND	SMC

ZEICHNER FCI

VG64.BEv1.01 B

FLASH-EPROM BANK C

RES-N
(3/20,4/50,6/2A,7/1B,7/5D)
(17/1A,18/3C,20/2D,21/7B)
(9/8C,12/2C,13/2C,14/2C)

ADV
(9/5D,10/5A,20/7C)

CLKCPU
(3/2D,4/4B,7/2C,9/5B,10/5A)
(20/7C,21/7B)

RD-FLASH

R19 1K
R2 10K
R20 1K
R38 1K
R3 10K
R246 100R

D11
28F016XS

+5V
RY/BY-FLASH
(6/2C,10/8A,20/2C)
VPP
(9/4B,10/8A,13/2C,20/7C)
+5V
C132 100N
C133 100N

RP, CE0, CE, ADV, 3/5, CLK, WE, OE, BYTE, WP
RY/BY, VPP, VCC, VCC, VCC, GND, GND, GND
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20
DQ0 DQ1 DQ2 DQ3 DQ4 DQ5 DQ6 DQ7 DQ8 DQ9 DQ10 DQ11 DQ12 DQ13 DQ14 DQ15

A4-MEM A5-MEM A6-MEM A7-MEM A8-MEM A9-MEM A10-MEM A11-MEM A12-MEM A13-MEM A14-MEM A15-MEM A16-MEM A17-MEM A18-MEM A19-MEM A20-MEM A21-MEM

D0-MEM D1-MEM D2-MEM D3-MEM D4-MEM D5-MEM D6-MEM D7-MEM D8-MEM D9-MEM D10-MEM D11-MEM D12-MEM D13-MEM D14-MEM D15-MEM

CS-FLASH1
(9/3D,20/2E)

WR-FLASH
(9/5C,10/5B,10/5C,20/2E)

BA2
(9/5D,10/5D,20/2B)

BA3
(9/5D,10/5D,20/2C)

R4 1K
R43 10K
R5 1K
R6 10K

D2
28F016XS

C142 100N
C143 100N
+5V

A4-MEM A5-MEM A6-MEM A7-MEM A8-MEM A9-MEM A10-MEM A11-MEM A12-MEM A13-MEM A14-MEM A15-MEM A16-MEM A17-MEM A18-MEM A19-MEM A20-MEM A21-MEM

D16-MEM D17-MEM D18-MEM D19-MEM D20-MEM D21-MEM D22-MEM D23-MEM D24-MEM D25-MEM D26-MEM D27-MEM D28-MEM D29-MEM D30-MEM D31-MEM

FLASH-EPROM BANK 1

ADV
CLKCPU
WR-FLASH
RD-FLASH
CS-FLASH

FÜR DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR

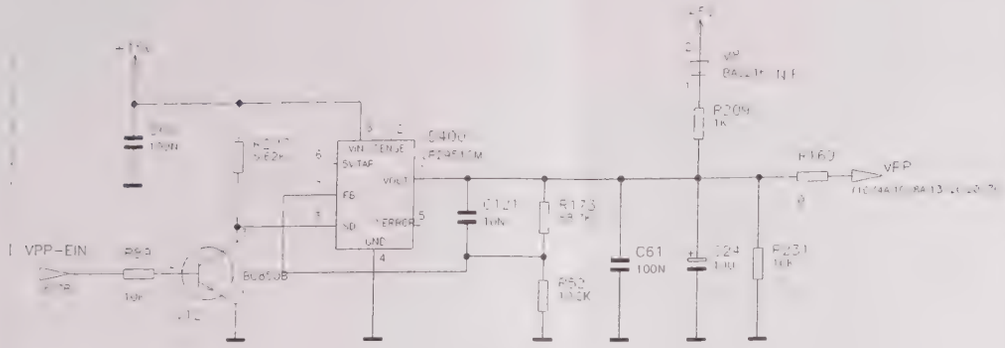
Bindende Angaben ueber Varianten, Trimmwerte, Bauteile und nicht bestueckte Bauteile siehe SA.

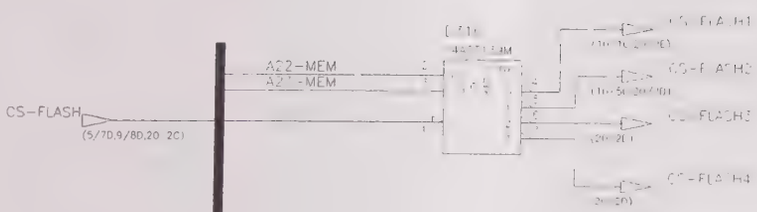
Bindende Angaben ueber Varianten, Trimmwerte, Bauteile und nicht bestueckte Bauteile siehe SA.

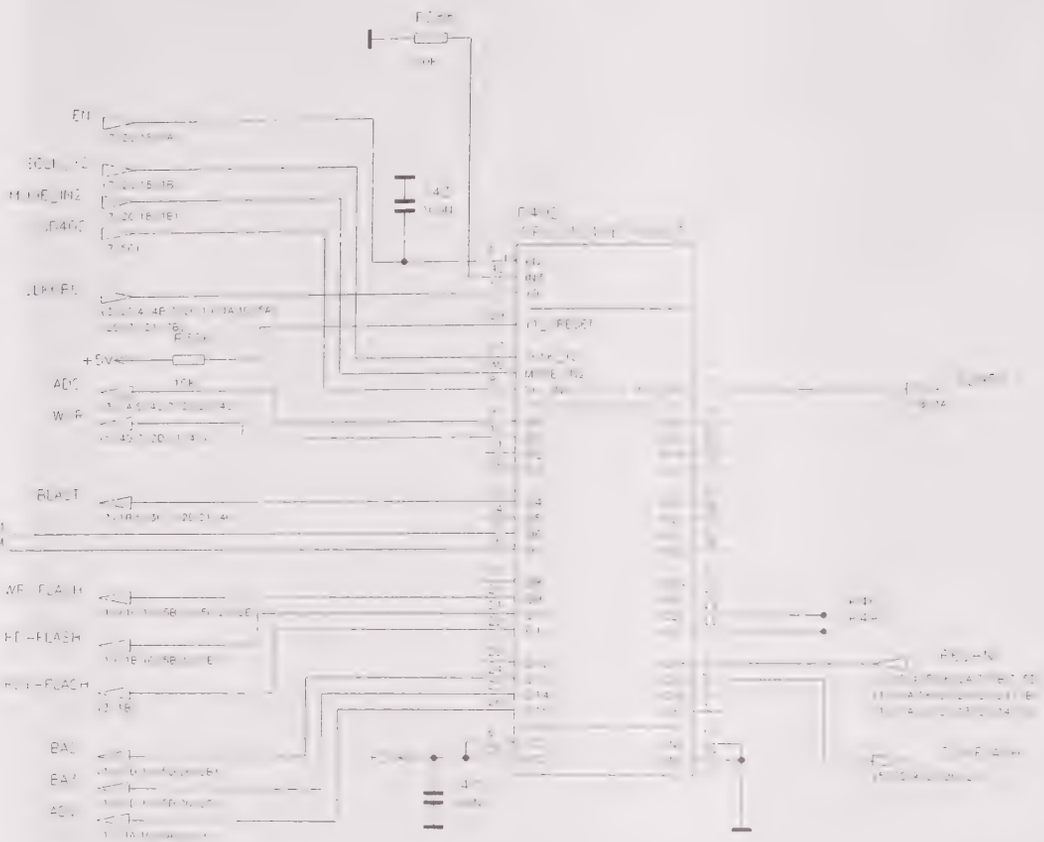
IND	AENDERUNGS-MITTEILUNG	DATUM	NAME

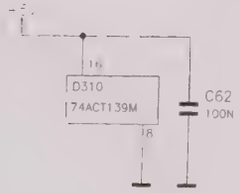
	DATUM	NAME
GEPR		
NORM		
FREIG	29-01-98	SPECHLER

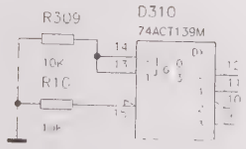
RECHNER


VPP-EIN
R60
BC858B
C400
VIN SENSE
SV-TAP
VOUT
FB
SD
ERROR
GND
C121
1NN
R173
C61
100N
C124
R231
R209
1K
R160
VPP


A22-MEM
A23-MEM
CS-FLASH
(5/7D,9/8D,20 2C)
D310
74ACT139M
CS-FLASH1
CS-FLASH2
CS-FLASH3
CS-FLASH4


EN
BCLK
MUXE_IN2
LDAC
LRCLK
+5V
ADC
WR
BLAST
WE_FLASH
RT-FLASH
BAL
BA2
AC0


16
D310
74ACT139M
C62
100N
8


R309
10K
R10
D310
74ACT139M

DATUM
NAME
PUBLIC SCHWARZ
1034.3504.01

BATTON
(4/5C)

CS-RAM
(5/7C,7/5E,20/2C)

RD-MEM1
(7/20,7/6B,20/2C)

WR-RAM
(7/20,20/2C)

BE2-MEM

BE0-MEM

BE3-MEM

BE1-MEM

D71 74AC02

D72 74ACT32M

D14 HM628512

A2-MEM	12	I/O1	D0-MEM
A3-MEM	11	I/O2	D1-MEM
A4-MEM	10	I/O3	D2-MEM
A5-MEM	9	I/O4	D3-MEM
A6-MEM	8	I/O5	D4-MEM
A7-MEM	7	I/O6	D5-MEM
A8-MEM	6	I/O7	D6-MEM
A9-MEM	5	I/O8	D7-MEM
A10-MEM	27		
A11-MEM	26		
A12-MEM	23		
A13-MEM	25		
A14-MEM	4		
A15-MEM	28		
A16-MEM	3		
A17-MEM	31		
A18-MEM	2		
A19-MEM	30		
A20-MEM	1		

D17 HM628512

A2-MEM	12	I/O1	D8-MEM
A3-MEM	11	I/O2	D9-MEM
A4-MEM	10	I/O3	D10-MEM
A5-MEM	9	I/O4	D11-MEM
A6-MEM	8	I/O5	D12-MEM
A7-MEM	7	I/O6	D13-MEM
A8-MEM	6	I/O7	D14-MEM
A9-MEM	5	I/O8	D15-MEM
A10-MEM	27		
A11-MEM	26		
A12-MEM	23		
A13-MEM	25		
A14-MEM	4		
A15-MEM	28		
A16-MEM	3		
A17-MEM	31		
A18-MEM	2		
A19-MEM	30		
A20-MEM	1		

D18 HM628512

A2-MEM	12	I/O1	D16-MEM
A3-MEM	11	I/O2	D17-MEM
A4-MEM	10	I/O3	D18-MEM
A5-MEM	9	I/O4	D19-MEM
A6-MEM	8	I/O5	D20-MEM
A7-MEM	7	I/O6	D21-MEM
A8-MEM	6	I/O7	D22-MEM
A9-MEM	5	I/O8	D23-MEM
A10-MEM	27		
A11-MEM	26		
A12-MEM	23		
A13-MEM	25		
A14-MEM	4		
A15-MEM	28		
A16-MEM	3		
A17-MEM	31		
A18-MEM	2		
A19-MEM	30		
A20-MEM	1		

D19 HM628512

A2-MEM	12	I/O1	D24-MEM
A3-MEM	11	I/O2	D25-MEM
A4-MEM	10	I/O3	D26-MEM
A5-MEM	9	I/O4	D27-MEM
A6-MEM	8	I/O5	D28-MEM
A7-MEM	7	I/O6	D29-MEM
A8-MEM	6	I/O7	D30-MEM
A9-MEM	5	I/O8	D31-MEM
A10-MEM	27		
A11-MEM	26		
A12-MEM	23		
A13-MEM	25		
A14-MEM	4		
A15-MEM	28		
A16-MEM	3		
A17-MEM	31		
A18-MEM	2		
A19-MEM	30		
A20-MEM	1		

D20 HM628512 C59 100N

D71 74AC02 C18 100N

D71 74AC02

D72 74ACT32M

R260 10K

+5V

D72 74ACT32M C183 100N

ACHTUNG, EGB !
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG.
ATTENTION ESD !
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING

BEHALTEN WIR UNS ALLE RECHTE VOR

AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME

GE-FR		
GEPR.		
NORM		
PLOTT	99-01-25	DRDORNER

ROHDE&SCHWARZ

FAST CP

TOP/TOP 8

ZEICHN.-NR. 1084.8504.01 S

BLATT-NR 8 +

ZU GERAET SMIQ

REGLV 1084.8004

ERSTE Z. 1084.8

BEHALTEN WIR UNS ALLE REC HTE VOR

F1

V9
BZV55B5V1

R204

V13
HSMS2800

C16P
10N

P1

SA5216

UBATT

RS1
47R

V2
BC860B

V14
HSMS2800

R203
220

UBRESET

K1

UBATT_TST
(13/2C)

REL1A1U

R222

RES-N
(3/2D,4/5D,6/2A,7/5D,9/8C)
(10/1A,12/2C,13/2C,14/2C)
(7/1A,18/3C,20/2D,21/7B)

P12
10R

V11
BC850B

BOOTEPROM

+5V

R206
10K

RD-MEM1

CS-EPROM

D-BUS-MEM

EN
(9/5B,18/1A)

CLKCPU
(3/2D,4/4B,9/5B,10/1A,10/5A)

SCLK_Y2
(9/5B,18/1B)

MODE_IN2
(9/5B,18/1B)

SD300
(18/3B)

R205
10R

C51
10N

D300
ISPLSI1016-60LT

EN
IN3
RESET
SCLK_Y2
MODE_IN2
SDI_INO
IN1_SDO
IO0
IO1
IO2
IO3
IO4
IO5
IO6
IO7
IO8
IO9
IO10
IO11
IO12
IO13
IO14
IO15
VCC
IO16
IO17
IO26
IO27
IO28
IO29
IO30
IO31
GND

ADS
(3/1A,5/4D,9/5B,21/4C)

W/R
(5/4D,9/5C,21/4C)

BLAST
(5/4D,9/5C,21/4C)
(3,18/5,30/4,5C,21/4C)

CS-EPROM
(5/7D,7/6B,20/2D)

CS-SPEICHER
(5/5B,20/2D)

P936

RD-MEM1
(7/6B,8/2B,20/2C)

WR-RAM
(8/2B,20,20)

RD-PERI1
(6/2B,11/5B,13/6B,15/2B,16/2B)
(16,2C,17,3B,17/5A,19/6B)

SD40[illegible]

RES-N
(3/2D,4/5D,6/2A,7/1B,9/8[illegible]
(17/1A,18/3C,20/2D,21/7B
(10/1A,12/2C,13/2C,14/2[illegible]

P932

CS-RAM
(5/7C,8/2B,[illegible]

CS-PERI
(3/6D)

C187
100N

+5V

C50
100N

D301
270216

D-BUS-MEM

	DATUM	NAME	
BEARB		DF	
GEPR			
NORM			
FREIG	[illegible]	PROGRAMMER	

ENTWICKLUNGS-ABTEILUNG

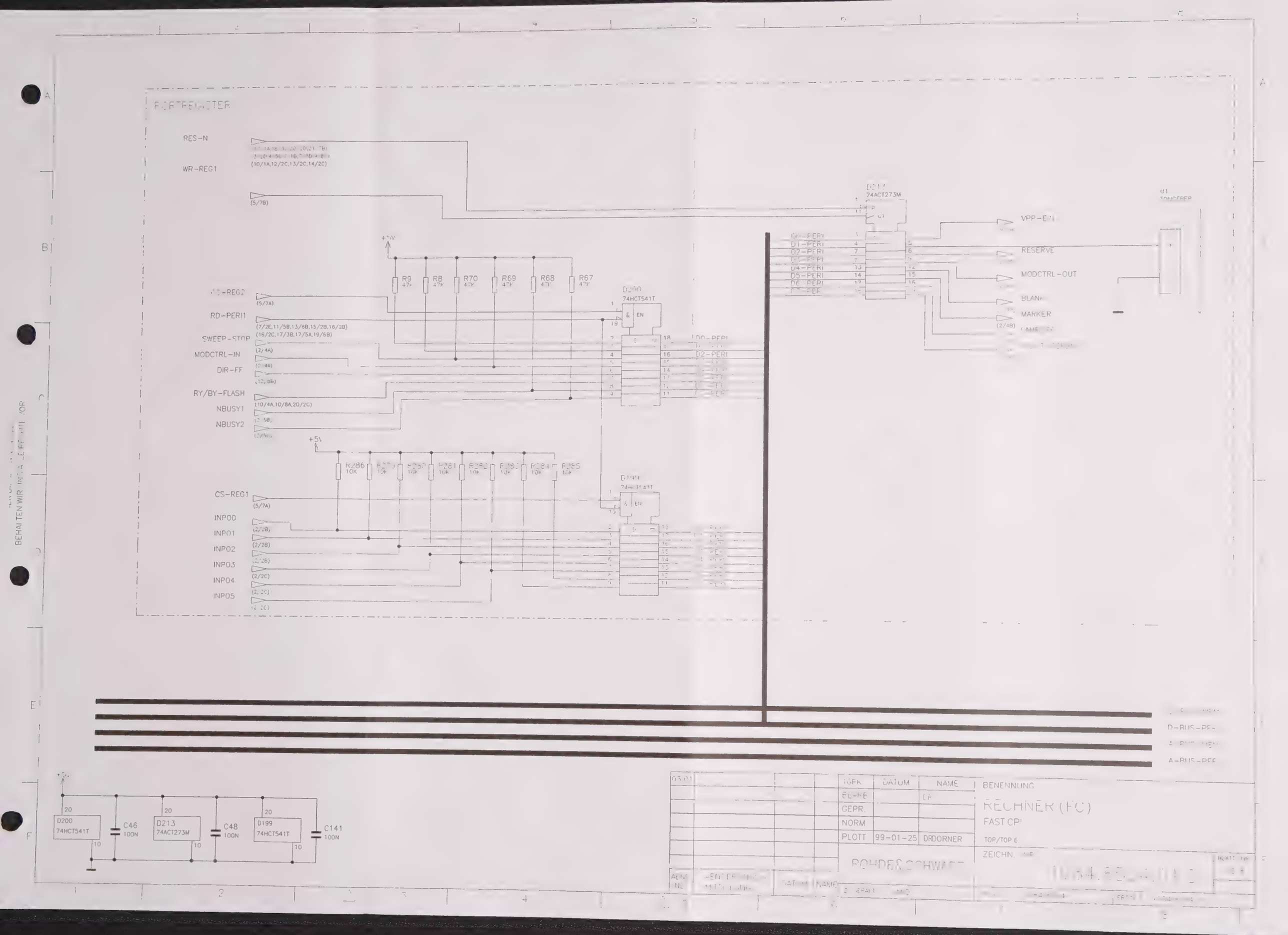
DATUM

NAME

RECHNER[illegible]HARD

[illegible]

1084.3504.13



PORTREGISTER
RES-N
WR-REG1
(10/1A,12/2C,13/2C,14/2C)
(5/7B)
+5V
R9 47K
R8 47K
R70 47K
R69 47K
R68 47K
R67 47K
CS-REG2
(5/7A)
RD-PERI1
(7/2E,11/5B,13/6B,15/2B,16/2B)
(16/2C,17/3B,17/5A,19/6B)
SWEEP-STOP
(2/4A)
MODCTRL-IN
DIR-FF
RY/BY-FLASH
(10/4A,10/8A,20/2C)
NBUSY1
NBUSY2
D200
74HCT541T
EN
D0-PERI
D2-PERI
D213
74ACT273M
D1-PERI
D2-PERI
D4-PERI
D5-PERI
VPP-EN
RESERVE
MODCTRL-OUT
BLANK
MARKER
(2/4B)
U1
TONGEBER
R286 10K
R281 10K
R285 10K
CS-REG1
(5/7A)
INP00
INP01
INP02
INP03
INP04
INP05
(2/2B)
(2/2C)
D-BUS-PER
A-BUS-PER
D200 74HCT541T
D213 74ACT273M
D199 74HCT541T
C46 100N
C48 100N
C141 100N
BEHALTEN WIR INDIA LE RECHTE VOR
GEPR.
NORM
PLOTT
99-01-25
DRDORNER
BENENNUNG
RECHNER (FC)
FAST CPU
TOP/TOP 6
ZEICHN.
ROHDE&SCHWARZ

BUFFER

D220
74FCT244
BE0-MEM
BE1-MEM
BE3-MEM
A2-MEM
BLE-PERI
A1-PERI
BHE-PERI
A2-PERI

D220
74FCT244
A3-MEM
A4-MEM
A5-MEM
A6-MEM
A3-PERI
A4-PERI
A5-PERI
A6-PERI

D221
74FCT244
A7-MEM
A8-MEM
A9-MEM
A10-MEM
A7-PERI
A8-PERI
A9-PERI
A10-PERI

D221
74FCT244
A11-MEM
A12-MEM
A13-MEM
A14-MEM
A11-PERI
A12-PERI
A13-PERI
A14-PERI
R277
10K

D223
74FCT138M
A28-MEM
A29-MEM
A30-MEM
A31-MEM
R15
10K
R16
10K
CS-UART
(16/2B)
CS-ADC
(13/6B)
CS-D/A
(14/2C)
CS-IEC
(15/2B)
CS-TIMER
(16/2D)

D224
74FCT138M
R271
10K
CS-SERBUS
CS-SPEIER

D222
74FCT244
A15-MEM
A16-MEM
A17-MEM
BLAST
(3/18,7/20,9/50,21/4C)
A15-PERI
BLAST-PERI
(18/2C)

D222
74FCT244
A25-MEM
BE2-MEM
ADS
(7/20,9/50,21/4C)
(3/18,7/20,9/50,21/4C)
A25-PERI
BE2-PERI
ADS-PERI
(18/2C)
R278
10K

D227
74ACT138M
A2-MEM
A3-MEM
A4-MEM
R272
10K
R273
10K
CS-REG1
(6/2D)
CS-REG2
(6/2B)
CS-REG3
(19/6B)
CS-REG4
(11/5A)
CS-REG5
(11/5B)
CS-REG6
(17/3B)
CONV-ADC
(13/6B)

74ACT138M
A3-MEM
R274
10K
WR-PERI1
(17/1C)

CS-RAM
(7/5E,8/28,20/2

CS-FLASH
(9/2

CS-EPROM
(7/20,7/6B,20/20)

+5V
D220 74FCT244 C38 100N
D221 74FCT244 C39 100N
D222 74FCT244 C41 100N
D223 74FCT138M D224 74FCT138M C40 100N
D226 74ACT138M D227 74ACT138M C42 100N

				1GPK	DATUM	NAME	BENENNUNG
				BEARB.		DR	RECHNER (FC)
				GEPR.			FAST CPU
				NORM			TOP/TOP 5
				PLOTT	99-01-25	DRDORNER	
AENG IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ			ZEICHN.-NR. 1084.8504.01 S
				ZU GERAET SMIQ			BLATT-NR 5 +
				REG I V 1084.8004			ERSTE Z. 1084.8004.01

BEHALTEN WIR UNS ALLE RECHTE V...

ROHDE&SCHWARZ

SERVICEUNTERLAGEN SME

Baugruppe Referenz/Stepsynthese

1035.6501.02

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Schaltteilliste
Koordinatenliste
Stromlauf
Bestückungsplan

7. Prüfen und Instandsetzen der Baugruppe

7.1 Funktionsbeschreibung

Die Baugruppe Referenz/Stepsynthese besteht aus den beiden Funktionsblöcken *Referenzfrequenzen* und *Stepsynthese*.

Die Funktionseinheit *Referenzfrequenzen* erzeugt die notwendigen Bezugs- und Referenzfrequenzen für die übrigen Synthese- und Modulationsbaugruppen im Gerät.

Die Funktionseinheit *Stepsynthese* liefert ein Ausgangssignal im Frequenzbereich von 103..117MHz, dessen Oberwellen die Grobauflösung der Synthese liefern.

7.1.1 Referenzfrequenzen

Das Herzstück der Signalerzeugung ist ein rauscharmer 100MHz-Quarz-Oszillator, der über eine schmalbandige PLL wahlweise an einen internen oder externen Frequenzstandard angebunden wird. Durch Teilen, direktes Auskoppeln und Vervielfachen werden Frequenzen von 10, 50, 100 und 600MHz erzeugt.

7.1.1.1 100MHz-Erzeugung

Das 100MHz-Signal wird in einem konventionellen Quarzoszillator (V5) mit Serienresonanzkreis erzeugt. Eine zweite Stufe V35 verstärkt das ausgekoppelte Signal auf ca. 17dBm.

Über vier Gatestufen als Isolationsverstärker (V60, V70, V80, V90) wird das 100MHz-Signal auf der Baugruppe verteilt.

7.1.1.2 REFERENZ-PLL

In der Referenz-PLL werden die 100MHz über Teiler bis auf 1MHz - der *Vergleichsfrequenz* am Phasendetektor (D525) - heruntergeteilt.

Dabei werden 50MHz für das Referenzsignal REF50 an X72 und 10MHz für die Ausgabe des Frequenzstandards EXTREF an X73 abgezweigt.

Das *Referenzsignal* für den Phasendetektor D525 wird über den Multiplexer D520 aus IREF (TCXO), EREF (externe Quelle) und OREF (ROSC) über die Steuerbits R0 und R1 ausgewählt.

Der nachfolgende programmierbare Referenzteiler D510 teilt die möglichen Eingangsfrequenzen 1..16MHz auf 1MHz herab.

Die Ausgangsimpulse des digitalen Phasendetektors gelangen auf einen PI-Regler (N530 mit Beschaltung), der den 100MHz-Quarz-VCO steuert. Die Regelbandbreite der Referenz-PLL beträgt ca. 10Hz.

7.1.1.3 Frequenzstandards und ABSTIMMUNG TCXO/ROSC

Das Ausgangssignal des **TCXO** gelangt als TTL-Signal IREF auf den Multiplexer D520. Die Spannungsversorgung für den TCXO wird vom Gatter D535-D über das Steuerbit R1 automatisch abgeschaltet, wenn der TCXO nicht als Frequenzstandard ausgewählt ist.

Über den D/A-Wandler D555 (Auflösung: 12Bit) und den nachgeschalteten OPs N565 und N562 wird die Frequenz des TCXO feinabgestimmt. N562 addiert eine zusätzliche externe Tunespannung (Eingang EXTTUNE). OP N550 erzeugt für die Option ROSC eine genaue und temperaturstabile Abstimmspannung 0..12V am Ausgang OPTTUNE.

Das 10MHz-Signal vom **ROSC** und **externe Frequenzstandards** gelangen über die Eingänge X74 (OPTREF) und X73 (EXTREF) als TTL-Signale OREF und EREF auf Multiplexer D520.

Der Anschluß EXTREF (Buchse X73) hat somit bidirektionale Funktion. Wenn das Relais K1 geschlossen ist, gibt er 10MHz als Frequenzstandard aus. Bei geöffnetem K1, ist EXTREF Eingang für einen externen Frequenzstandard (1..16MHz).

7.1.1.4 600MHz-Erzeugung

Durch eine Kettenschaltung von zwei zu Verdreifacher und Verdoppler abgewandelten Differenzverstärkern werden aus 100MHz 600MHz erzeugt.

Hinter beiden Vervielfacherstufen folgen jeweils steile Bandpässe zur Selektierung des Nutzsignals.

Ein induktiver Leistungsteiler (L271) verteilt das 600MHz-Signal auf die Basisstufe V280 zur Stepsynthese und die Emitterstufe V285 zum Ausgang REF600.

Über das Steuerbit SR600 (OP N290) kann das Ausgangssignal REF600 von dem Pinschalter V290/V295 um ca. -40dB abgesenkt werden.

7.1.2 Stepsynthese

In der Step-PLL wird ein VCO 103..117MHz mit 100MHz auf 3..17MHz abgemischt und auf das Ausgangsignal eines programmierbaren Teilers 3..17MHz synchronisiert.

7.1.2.1 600MHz-Teiler DIVREF

Der programmierbare ECL-Teiler DIVREF (D310) teilt das 600MHz-Eingangssignal durch Teilerfaktoren von 17..100 mit Bruchteilern von minimal 1/8.

Das resultierende Ausgangssignal 6..34MHz wird mit dem folgenden D-Flip-Flop (D320) auf 3..17MHz heruntergeteilt. Über einen Tiefpaß gelangt es als *Referenzsignal* SDIV für die Step-PLL auf den Phasendetektor N470.

7.1.2.2 Mischer und Trennverstärker

Die *Vergleichsfrequenz ZFVCO* am Phasendetektor N470 wird durch Abmischen der VCO-Frequenz mit 100MHz erzeugt.

Ein Teil des VCO-Ausgangssignals wird über die RF-Stufe (N430, N440) auf den RF-Eingang des Mischers N380 geführt.

Der LO-Eingang von N380 wird von der Emitterstufe V380 mit 100MHz und einem Pegel von ca. 16dBm angesteuert.

Am IF-Ausgang von N380 entsteht u.a. das Differenzband 3..17MHz, welches über die ZF-Stufe N350 als *Vergleichsfrequenz* ZFVCO auf den Phasendetektor N470 gelangt. Die Ein- und Ausgangstiefpässe an N350 sorgen für die notwendige Unterdrückung der 100MHz-LO-Frequenz und höherer Mischprodukte.

7.1.2.3 REGLER STEP-PLL und RAMPENSTEUERUNG

Das Loop-Filter hinter N470 besteht aus einem konventionellen PI-Regler (N465 mit Beschaltung) und steilflankigen Tiefpässen an Ein- und Ausgang. Die Regelbandbreite der Schleife beträgt 350kHz. Die minimale Ausgangsspannung VSVCO wird durch V475/V473 auf ca. 0.5V begrenzt.

Große Frequenzsprünge außerhalb des Fangbereichs werden durch den analogen Frequenzdetektor mit nachfolgender Rampensteuerung realisiert. Parallel zum Phasendetektor werden Referenz- (SDIV) und Vergleichsfrequenz (ZFVCO) analog gemessen und von OP N460

verglichen. Bei Überschreiten einer Differenz von ca. 300kHz wird über Komperator N468-A/B und Analogschalter D460-A/B in Abhängigkeit vom Vorzeichen der Differenz ein konstanter Strom auf die Integrationskapazität C473 eingeprägt. Die dadurch erzeugte Spannungsrampe am Ausgang von N465 führt den Step-VCO bis in den Fangbereich der PLL, und wird dort wieder abgeschaltet.
Der Einschwingvorgang muß nach maximal 100µs abgeschlossen sein.

7.1.2.4 STEP-VCO 103..117MHz

Der Step-VCO (V408) ist ein konventioneller FET-Oszillator in Drainschaltung. V420 verstärkt das Signal auf einen definierten Pegel und führt es über einen resistiven Leistungsteiler zur RF-Stufe in die PLL und zur Ausgangsstufe V435 für die Step-Frequenz.

7.1.3 DATENÜBERTRAGUNG und DIAGNOSE

Die Ansteuerung der Baugruppe erfolgt über die serielle Schnittstelle SERBUS (D610). Über Strobe 1 werden die Diagnosemultiplexer adressiert, die Betriebsart der Referenz-PLL und die Tunespannung für TCXO/ROSC eingestellt. Über Strobe 2 erfolgen die zeitkritischen Einstellungen für den Teilerfaktor der Step-PLL und die Steuerung des Ausgangs REF600.

Über die Diagnose können alle Ausgangssignale der Baugruppe sowie einige interne Signale zur Funktionsprüfung und Fehlersuche abgerufen werden.

Die Regelspannungen der beiden VCOs - VQ100 und VSVCO - werden von Fensterkomparatoren (N680-A..D) mit nachfolgender Hystereseschaltung (D680-A..D) überwacht. Beim Ausrasten der Schleifen wird über IR0 und IR1 ein Interrupt ausgelöst.

7.2 Meßgeräte und Hilfsmittel

- Spektrumanalysator ...1.2GHz (z.B. FSA).
- 50Ω-Kabel mit Meßadapter für Bergsteckerpaare.
- Meßsender 1..16MHz, Frequenzgenauigkeit $<10^{-6}$ (z.B. SMG).
- Oszilloskop mit 100MHz Bandbreite (z.B. BOL).
- Digitales Speicher-Oszilloskop für Punkt 7.4.10.2 (z.B. BOS).
- Multimeter (DC-Spannungsgenauigkeit ±4mV bei 4V Eingangsspannung = ±0.1%, z.B. UDL44).
- Prüfspannungsquelle 0..20V (z.B. NGT20).
- Servicekit (1039.3520).

7.3 Fehlersuche

Die folgenden Fehlerbeschreibungen sind nur als grobe Übersicht zu verstehen.

Zur Fehlerlokalisation ist grundsätzlich eine Signalverfolgung aufgrund des Stromlaufs vorzunehmen. Dazu sind die Arbeitspunkte der Transistoren und die HF-Pegel an den jeweiligen Prüfpunkten vermerkt. Die HF-Prüfpunkte sind gleichspannungsfrei (Ausnahme: TTL-Pegel) und mit einem 475Ω-Widerstand auf Bergsteckerpaare mit Masseanschluß geführt.

Referenz-PLL rastet nicht	Referenz-PLL nach 7.4.3.1 überprüfen. Eingangssignale am Phasendetektor D525 über TPOINT 203 und 204 überprüfen. Eingang OPTREF nach 7.4.3.3 überprüfen. 100MHz-Quarz-VCO nach 7.4.2 prüfen.
Keine Ausgabe von 10MHz-Frequenzstandard	Prüfe Ausgang EXTREF nach 7.4.3.2
Feinabstimmung von TCXO/ROSC nicht möglich	Funktionsfähigkeit der Referenz-PLL nach 7.4.3.1 sicherstellen. Tuning nach 7.4.4 prüfen.
Kein Signal an REF50	Funktion des 100MHz-Quarz-VCOs über TPOINT 209 sicherstellen. Ausgang REF50 (TPOINT 207) nach 7.4.12 prüfen.
Kein Signal an REF100	Ausgang REF100 (TPOINT 209) nach Punkt 7.4.12 prüfen. 100MHz-Quarz-VCO nach 7.4.2 prüfen.
Kein Signal an REF600	Funktion des 100MHz-Quarz-VCOs über TPOINT 209 sicherstellen. 300MHz-Zwischenfrequenz über TPOINT 206 prüfen und evtl. Abgleich nach 7.4.5.1 wiederholen. Ausgang REF600 (TPOINT 210) nach Punkt 7.4.5.3 prüfen und evtl. Abgleich nach 7.4.5.2 und 7.4.5.3 wiederholen.
Ausgangssignale mit starkem Phasenjitter	Alle Ausgangssignale der Baugruppe haben einen starken Phasenjitter im NF-Bereich: 100MHz-Quarz B20 auswechseln.

7.3.2 Stepsynthese

Step-PLL rastet nicht

LO-Signal am Phasendetektor N470 über TPOINT 213 prüfen.
Pegel des 600MHz-Eingangstakt für Teiler D310 nach 7.4.5.3 prüfen.

RF-Signal am Phasendetektor N470 über TPOINT 214 prüfen.
Pegel am LO-Eingang von N380 nach 7.4.6 prüfen.
Step-VCO nach 7.4.7.2 prüfen. RF- und ZF-Pegel nach 7.4.8 prüfen.

Weitere Fehlersuche unter *Nebenwellenburst auf Step-Frequenz.*

Nebenwellenburst auf Step-Frequenz

Die Step-Frequenz läßt sich zwar prinzipiell einstellen, hat jedoch ein breites Störspektrum.

Rampensteuerung nach 7.4.9 prüfen.

Falls bis hier kein Fehler gefunden wurde, kommt der Komparator N468, der Analogschalter D460, der Phasendetektor N470 oder der OP N465 in Betracht.

Feinabgleich nach 7.4.10.1 wiederholen.

Einschwingprobleme der Step-Frequenz

Einrastvorgang der Step-PLL benötigt mehr als 100us.

Einschwingverhalten der Step-PLL nach 7.4.10.3 prüfen.
Rampensteuerung nach 7.4.10.1 neu abgleichen.

7.4 Prüfen und Abgleich

Zum kompletten Abgleich der Baugruppe sind die einzelnen Prüf- und Abgleichpunkte unter 7.4 in der genannten Reihenfolge durchzuführen. Ansonsten wird auf Prüf- und Abgleichpunkte bei der Fehlersuche 7.3 hingewiesen.

Zu den einzelnen Punkten ist jeweils vermerkt, welche Baugruppendeckel montiert werden müssen.

Die RF-Frequenzeinstellungen sind grundsätzlich im CW-Betrieb (MODULATION OFF) durchzuführen.

7.4.1 Datenübertragung und Stromaufnahme

- Einstellungen A: **UTILITIES/DIAG/TPOINT/STATE ON**
  /TEST POINT 202
  UTILITIES/REF OSC/SOURCE INT
  /ADJUSTMENT STATE ON
  /FREQUENCY ADJUSTMENT 2000

- Einstellungen B: **UTILITIES/DIAG/TPOINT/STATE ON**
  /TEST POINT 213
  UTILITIES/REF OSC/SOURCE EXT
  /EXT FREQUENCY 7 MHz

▶ Logische Zustände nach folgender Tabelle prüfen:

Subadresse 0			Subadresse 1		
SME-Einstellung	D620 (Byte 0) 4 5 6 7 14	D630 (Byte 1) 4 5 6 7 14 12 11	SME-Einst. FREQ	D330 (Byte 0) 4 5 6 7 14 13 12 11	D340 (Byte 1) 4 5 11
A	L H L H L	L H H L H L L	912 MHz	H H H L L L H H	L L H
B	H L H L H	H L L H L H H	877 MHz	L L L H H H L L	H L H
			88 MHz	L L L L L L L L	L H L

Die High-Pegel an D620 (Subadresse 0/Byte 0: Adressierung der Diagnosepunkte) liegen nicht statisch an.
Byte 3 und 4 von Subadresse 0 (Tunespannung TCXO/ROSC) sind hardwaremäßig nicht erreichbar und werden deshalb bei Einstellung A über den angezeigten Diagnosewert geprüft:
▶ TPOINT 202 = -6..-4V

Prüfen der Stromaufnahme:

- Durch Auslöten der Eingangsdrosseln L100..L104 und Einschleifen eines Amperemeters kann die Stromaufnahme der Baugruppe gemessen werden (Für die Sollwerte siehe Kapitel 7.7).

7.4.2 100MHz-QUARZ-VCO

- Prüfspannungsquelle mit 7V Abstimmspannung an X541/X542 (X542=Masse) anschließen.
- Voltmeter an P10 anschließen.
- Spektrumanalysator (Span 0..500MHz, Ref.-Level 0dBm) an P40/P41 (P41=Masse) anschließen.

▶ Mit L5 Spannung an P10 auf Minimum abgleichen.
▶ Mit L20 die Spannung an P10 für die beiden Endpunkte der Abstimmspannung 1V und 13V jeweils auf den gleichen Wert bringen, so daß die Spannungsänderung an P10 über den Abstimmbereich 1..13V minimal wird.
▶ Absolute Spannung an P10 über 1..13V Abstimmspg. = 10.2 .. 11.2V
Spannungsänderung an P10 über 1..13V Abstimmspg. < 0.2V

▶ Abstimmspannung zwischen -1V und +1V variieren:
Die 100MHz-Schwingung darf nicht abbrechen!

- Abstimmspannung auf 7V einstellen

▶ Mit L35 das 100MHz-Signal an P40 auf -3dBm+/-0.3dBm abgleichen.
▶ Prüfe Pegel an X71 (REF100) auf 4..6dBm.

- ***Nach Entfernen der Prüfspannungsquelle Brücke auf X540-X541 stecken.***

7.4.3 REFERENZ-PLL für 100MHz-QUARZ-VCO

7.4.3.1 Funktionsfähigkeit der REFERENZ-PLL

- Einstellungen: **UTILITIES/REF OSC/SOURCE INT**
  /ADJUSTMENT STATE ON
  /FREQUENCY ADJUSTMENT 2000

▶ Prüfe TPOINT 201 = 2..12V

- Meßsender mit 10MHz/-13dBm an REF (Rückwand) anschließen.

- Einstellungen: **UTILITIES/REF OSC/SOURCE EXT**
  /EXT FREQUENCY 10 MHz

- Frequenz des Meßsenders nach Tabelle verstellen und Regelspannung über TPOINT 201 prüfen:

Frequenz in MHz	Sollwert TPOINT 201	Fehlermeldung SME
10.000000	5..10V	-
10.000100 9.999900	<12V >2V	- -
10.000400 9.999600	>12.5V <-12.5V	Reference Frequency 100MHz VCXO unlocked Reference Frequency 100MHz VCXO unlocked

7.4.3.2 Ausgang EXTREF

- Spektrumanalysator (Span 0..100MHz, Ref.-Level 10dBm) an REF (Rückwand) anschließen.

- Einstellungen: **UTILITIES/REF OSC/SOURCE INT**

▶ Pegel des 10MHz-Frequenzstandard = 6..10dBm
Harmonische < -15dBc

7.4.3.3 Eingang OPTREF

Diese Prüfanweisung ist nur möglich, wenn die Option ROSC Ofenquarz (SM-B1) im Gerät vorhanden ist.

- Einstellungen: **UTILITIES/REF OSC/SOURCE INT**
ADJUSTMENT STATE OFF

▶ Prüfe TPOINT 201 = 2..12V

7.4.4 ABSTIMMUNG TCXO/ROSC

7.4.4.1 Referenzabgleich für D/A-Wandler

- Hochgenaues Voltmeter an Ausgang OPTTUNE (Motherboardverbindung: X70 A10) anschließen. Dabei ist auf eine gute Masseverbindung zwischen Voltmeter und Baugruppe zu achten.

- Einstellungen: **UTILITIES/DIAG/TPOINT/STATE ON**
  /TEST POINT 202
  UTILITIES/REF OSC/SOURCE INT
  /ADJUSTMENT STATE ON
  /FREQUENCY ADJUSTMENT 1333

▶ Mit R588 U_{OPTUNE} auf 4.000V+/-4mV abgleichen.
▶ Prüfe Spannungen nach Tabelle:

Meßpunkt	Art des Signals	Sollwert für **FREQUENCY ADJUSTMENT 1333**	Sollwert für **FREQUENCY ADJUSTMENT 2666**
TPOINT 202	Ausgangsspannung DAC	-3.33V±0.3V	-6.66V±0.6V
X70 A10	Tunespannung für ROSC	4V±0.004V	8V±0.010V
P580	Tunespannung für TCXO	1.6V±0.1V	3.3V±0.2V

7.4.4.2 Externe Tunespannung

- Prüfspannungsquelle an Eingang TUNE (Rückwand) anschließen.
- Voltmeter an P580 anschließen.

- Einstellungen: **UTILITIES/REF OSC/SOURCE INT**
  /ADJUSTMENT STATE ON
  /FREQUENCY ADJUSTMENT 2000

- Spannungen von -10V, 0V und +10V einstellen:
▶ Prüfe Spannung an P580 nach Tabelle:

Meßpunkt	Art des Signals	externe Spannung TUNE	Sollwert
P580	Tunespannung für TCXO	-10V 0V +10V	2.18..2.30V 2.40..2.50V 2.60..2.72V

7.4.5 600MHz-Referenzsignal REF600

Der Deckel der Lötseite muß montiert sein. Beachte 7.5!

7.4.5.1 Abgleich Bandpaß 300MHz

- Einstellungen: **UTILITIES/DIAG/TPOINT/STATE ON**
  /TEST POINT 206

▶ Pegel an TPOINT 206 (ZF300) über
(1.) L230 (Messingkern),
(2.) L231 (Ferritkern),
(3.) L234 (Ferritkern),
(4.) L235 (Messingkern) auf Maximum abgleichen.
Dabei reicht ein Abgleich je Trimmer in obiger Reihenfolge aus.

Die Kerne dürfen nicht aus den Spulen herausgedreht werden und verloren gehen (Vorsicht beim Linksdrehen!).

▶ Pegel TPOINT 206 = 0.1V .. 0.4V

7.4.5.2 Abgleich Bandpaß 600MHz

- Spektrumanalysator (Span 0..1GHz, Ref.-Level 10dBm) an Ausgangsbuchse REF600 anschließen.

- Einstellungen: **FREQ 90 MHz**
  UTILITIES/DIAG/TPOINT/STATE ON
  /TEST POINT 210

▶ Pegel an TPOINT 210 (REF600) über
(1.) L265 (Messingkern),
(2.) L266 (Messingkern),
(3.) L267 (Messingkern),
(4.) L268 (Messingkern) auf Maximum abgleichen.
Dabei reicht ein Abgleich je Trimmer in obiger Reihenfolge aus.

Die Kerne dürfen nicht aus den Spulen herausgedreht werden und verloren gehen (Vorsicht beim Linksdrehen!).

7.4.5.3 Abgleich Pegel REF600

- Einstellungen und Meßgeräte wie unter 7.4.5.2.

▶ Mit R254 Pegel auf 11dBm+/-0.2dB abgleichen.
(Baugruppen-Hauptänderungsindex 1..3)
▶ Mit R254 Pegel auf 14dBm+/-0.2dB abgleichen. (Äi. ab 4)

▶ Prüfe Pegel nach Tabelle:

Meßpunkt	Art des Signals	Sollwert	Bemerkung
X77 REF600	600MHz-Referenzfrequenz	11dBm±0.2dB 14dBm±0.2dB	Äi. 1..3 Äi. ab 4 Einstellung: **FREQ < 93.75MHz**
	600MHz abgeschaltet	<-25dBm	Einstellung: **FREQ >= 93.75MHz**
TPOINT 210	600MHz über Diagnose	0.2V..0.6V	Einstellung: **FREQ < 93.75MHz**
P255	600MHz-Takt für Step-Teiler	>-21dBm >-24dBm	Äi. 1..4 Äi. ab 5 mit 50Ω-Kabel messen.

7.4.6 LO-STUFE

- Spektrumanalysator (Span 90..110MHz, Ref.-Level 0dBm) an P390/P391 (P391=Masse, Kammer K) anschließen.

▶ Pegel an P390 = -10..-6dBm

7.4.7 STEP-VCO

7.4.7.1 Grobabgleich des Abstimmbereichs

- Spektrumanalysator (Span 90..130MHz, Ref.-Level 10dBm) an Ausgangsbuchse X75 FSTEP anschließen.
- Prüfspannungsquelle an X406/X407 (X407=Masse) anschließen.

- Abstimmspannung auf 18V einstellen.
▶ Mit L406 Step-Frequenz auf 116..118MHz abgleichen.
- Abstimmspannung auf 2V einstellen.
▶ Mit C400 Step-Frequenz auf 102..103.5MHz abgleichen.

▶ Abgleich von L406 und C400 wiederholen bis die genannten Frequenzen eingehalten werden.

7.4.7.2 Abgleich Pegel FSTEP

- VCO-Frequenz auf 110MHz einstellen.

▶ Mit R412 Pegel auf 6dBm+/-0.4dBm abgleichen.

▶ Frequenz von 103 bis 117MHz durchfahren:
Zulässiger Pegelbereich an X75 FSTEP: 5.2dBm .. 6.8dBm
Pegeländerung: < 0.8dB
Harmonische: < -20dBc

7.4.8 RF- und ZF-STUFE

- Weiterhin Prüfspannungsquelle an X406. Step-VCO-Frequenz auf 110MHz einstellen.
- Spektrumanalysator (Span 100..120MHz, Ref.-Level 0dBm) an P460/P461 anschließen.

▶ Mit R441 Pegel auf -26dBm+/-0.2dBm abgleichen.

▶ Prüfe Pegelbedingungen im genannten Frequenzbereich:

Meßpunkt	Art des Signals	Sollwert	Abstimmspannung an X406
P460	RF-Signal 110MHz RF-Signal 103..117MHz	-26dBm±0.2dBm -27..-24.5dBm, Variation <1.2dBm	ca. 10V ca. 2..18V
P360 (TPOINT 214)	ZF-Signal 3..17MHz	-23dBm..-19dBm, Variation <2dBm	ca. 2..18V

7.4.9 Inbetriebnahme der RAMPENSTEUERUNG

- Weiterhin Prüfspannungsquelle an X406. Spannung auf 16V einstellen.
- Voltmeter an P466/465 (P465=Masse) anschließen.
- Brücke über X461-X462 stecken.

▶ Mit R469 Spannung an P466 auf 0V+/-5mV abgleichen.
▶ Spannung an X406 von 2..18V durchfahren:
Spannung an P466 (TPOINT 208) = -25mV..25mV

- ***Danach Brücke über X460-X461 und über X405-X406 stecken.***

7.4.10 Geschlossene STEP-PLL

Der Deckel der Lötseite muß montiert sein. Beachte 7.5!

7.4.10.1 Feinabgleich der RAMPENSTEUERUNG

- Voltmeter an P466/465 (P465=Masse) anschließen.
- Einstellungen: **UTILITIES/DIAG/TPOINT/STATE ON**
  /TEST POINT 208
  FREQ 820 MHz (FSTEP 115MHz)

▶ Mit R469 Spannung an P466 auf 0V+/-4mV abgleichen.

- Einstellungen: **FREQ 943 MHz** (FSTEP 103.06MHz)
  FREQ 895 MHz (FSTEP 110.00MHz)
  FREQ 836 MHz (FSTEP 117.27MHz)

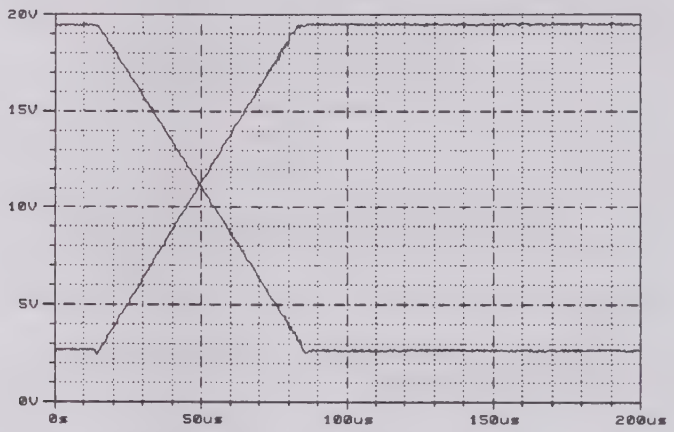
▶ Für alle drei Einstellungen muß gelten:
Spannung an P466 (TPOINT 208) = -10mV .. 10mV

7.4.10.2 Einschwingverhalten der STEP-PLL

• Digitales Speicher-Oszilloskop an X406/X407 (X407=Masse) anschließen.

• Einstellungen **SWEEP/FREQ/START FREQ 836MHz** (FSTEP 117.27MHz)
/STOP FREQ 943MHZ (FSTEP 103.06MHz)
/STEP LIN 107MHZ
/DWELL 20ms
/SPACING LIN
/MODE AUTO

▶ Es sollte sich qualitativ folgendes Oszillogramm ergeben:



x-Achse: Zeit
y-Achse: Abstimmspannung Step-VCO

Im Oszillogramm ist der Spannungsverlauf beider Frequenzsprünge (103->117MHz, 117->103MHz) gleichzeitig dargestellt. Durch den fehlenden Baugruppendeckel liegt das Niveau der Abstimmspannung gegenüber dem abgeglichenen Zustand mit Deckel (103MHz/2V, 117MHz/18V) etwas höher.

▶ Nach dem Abschalten der Rampe müssen alle Einschwingvorgänge spätestens nach 100us - vom Rampenbeginn an gerechnet - abgeklungen sein.

7.4.10.3 Feinabgleich des VCO-Abstimmbereichs

Beide Baugruppendeckel müssen montiert sein. Beachte 7.5!

• Einstellungen: **UTILITIES/DIAG/TPOINT/STATE ON**
/TEST POINT 212

• Einstellung: **FREQ 834 MHz** (FSTEP 117.02MHz)
▶ Mit L406 U(TPOINT 212) auf 18V±0.2V einstellen.
• Einstellung: **FREQ 1149 MHz** (FSTEP 103.05MHz)
▶ Mit C400 U(TPOINT 212) auf 2V±0.2V einstellen.

▶ Abgleich von L406 und C400 wiederholen bis die genannten Bedingungen erfüllt sind.

7.4.11 Mischernebenwellen auf FSTEP

Beide Baugruppendeckel müssen montiert sein. Beachte 7.5!

- Spektrumanalysator an Ausgang FSTEP (X75) anschließen.
- Referenzausgang des Analysators an REF anschließen.

- Einstellungen: **UTILITIES/REF OSC/SOURCE EXT**
  /EXT FREQUENCY 10 MHz

- Die folgenden RF-Frequenzen einstellen und den Nebenwellenabstand bei den angegebenen Trägerabständen messen.

Einstellungen	Step-Teiler	Stepfrequenz (Trägerfrequenz)	Trägerabstand der Mischernebenw.	Absolute Frequenz der rechtsseitigen Mischernw.
FREQ 916 MHz	23.875	112.5654 MHz	523.56 kHz	113.0890 MHz
FREQ 928.8 MHz	21.125	114.2012 MHz	591.72 kHz	114.7929 MHz
FREQ 930.4 MHz	20.875	114.3713 MHz	598.80 kHz	114.9701 MHz
FREQ 833 MHz	17.875	116.7832 MHz	699.30 kHz	117.4825 MHz

▶ Nebenwellenabstand bei den genannten Trägerfrequenzen und Frequenzabständen: < -99dBc.

Um den Nebenwellenabstand im Bereich von -100dBc messen zu können, muß der Analysator auf den Trägerpegel kalibriert, dann um 10dB übersteuert und um den Frequenzabstand der Nebenwelle verstellt werden. Als SPAN bietet sich 10kHz an. Das Rauschniveau muß deutlich unter 100dBc liegen (Evtl. im AVERAGE-Modus messen).

7.4.12 Signalqualität REF600, REF100, REF50

Beide Baugruppendeckel müssen montiert sein. Beachte 7.5!

▶ Prüfe Harmonische und Störlinien nach Tabelle:

Meßpunkt	Spektrale Daten	Sollwert	Bemerkung
X77 REF600	1. Harmonische bei 1.2GHz 100MHz-Störlinien Störung durch Teilerspektrum Trägerabstand 3.0457MHz	<-40dBc <-85dBc <-85dBc	Meßbereich: 0..1GHz Einstellung: **FREQ 77.5MHz** (FSTEP 103.0457MHz) Meßbereich: 595..605MHz
X71 REF100	Signalpegel 100MHz Harmonische Nebenwellenabstand	4..6dBm <-25dBc <-85dBc	 insbesondere in 1, 10 und 50MHz-Abstand zum Träger
X72 REF50	Signalpegel 50MHz Harmonische Nebenwellenabstand	9..11.5dBm <-25dBc <-85dBc	 insbesondere in 1 und 10MHz-Abstand zum Träger

7.4.13 Diagnosepunkte

Die unterstrichenen Werte in der Tabelle werden mit dem Meßwert von Diagnosepunkt 200 automatisch korrigiert.

TPOINT	Beschreibung	Sollwert	Bemerkung
200	10kOhm Referenzwiderstand	-20mV...20mV	zur Offsetkompensation
201	Regelspannung 100MHz-Quarz-VCO	2...12V	
202	Ausgang D/A-Wandler für Tune-Spannung	**-10.1...0.01V**	Wert = ADJUSTMENT * (-2.5mV) U(OPTTUNE) = Wert * (-1.2) U(P580) = Wert * (-0.5)
203	1MHz-Referenzsignal für Referenz-PLL	1.8...5.2V	
204	1MHz-Vergleichsfrequenz für Referenz-PLL	2.0...3.0V	
205	Ein-/Ausgang Frequenzstandard (EXTREF)	0.8...3.5	
206	300MHz-Zwischenfrequenz im Versechsfacher	0.1...0.4V	
207	50MHz-Ausgang REF50	0.3...1.3V	Abschluß mit 50Ω.
208	Ausgangsspannung Frequenzdetektor	**-40mV...40mV**	Step-PLL eingerastet
209	100MHz-Ausgang REF100	0.18...0.60V	Abschluß mit 50Ω.
210	600MHz-Ausgang REF600	0.2...0.6V -20...20mV	RF-Frequenz < 93.75MHz Abschluß mit 50Ω. RF-Frequenz >= 93.75MHz
211	24V-Versorgungsspannung	22.5...25.5V	
212	Regelspannung Step-VCO	1...20V	
213	Ausgangssignal Step-Teiler	0.4...2.5V	
214	Abgemischtes VCO-Signal 3..17MHz	**0.10..0.25V**	
215	Ausgang Stepfrequenz FSTEP 103..117MHz	0.2...0.6V	Abschluß mit 50Ω.

7.5 Zerlegung und Zusammenbau

Nach Öffnen des Gerätes, Lösen der Baugruppenverriegelung und der HF-Verbindungen, kann die Baugruppe aus ihrem Steckplatz gezogen werden. Beim Entfernen der Schirmdeckel muß zuerst der lötseitige abgeschraubt bzw. gelöst werden. Beim Zusammenbau der Schirmdeckel muß zuerst der bauteilseitige festgeschraubt werden. Wird diese Reihenfolge nicht eingehalten, verziehen sich die Gewindebolzen auf der Baugruppe und beschädigen so die Gewinde der bauteilseitigen Schrauben.

7.6 Digitale Schnittstelle

Baugruppenadresse: 20

Subadresse 0 (Strobe 1): statische Daten

Byte	Bit	Latch/Pin	Name	Funktion
3	7..4	-	-	-
	3..0	D555	TV11..TV8	Tunespannung für TCXO/ROSC (MSB)
2	7..0	D555	TV7..TV0	Tunespannung für TCXO/ROSC (LSB)
1	7	D630 11	R1	Auswahl 0 1 1
	6	12	R0	Frequenzstandard: 0 TCXO 0 ROSC 1 EXTREF
	5	13	-	-
	4	14	ENR0	Buchse EXTREF 0 = Eingang (1..16MHz) 1 = Ausgang (10MHz)
	3	7	NR3	Teiler für Frequenzstandard im Zweierkomplement (1..16) (MSB)
	2	6	NR2	-"- ...
	1	5	NR1	-"- ...
	0	4	NR0	-"- (LSB)
0	7	D620 11	-	-
	6	12	-	-
	5	13	-	-
	4	14	END1	Auswahl 0 1
	3	7	END0	Diagnosemultiplexer: 1 MUX 1 (D650) 0 MUX 2 (D660)
	2	6	DA2	Adressierung des Diagnosepunktes (MSB)
	1	5	DA1	-"- ...
	0	4	DA0	-"- (LSB)

Subadresse 1 (Strobe 2): dynamische Daten

Byte	Bit	Latch/Pin	Name	Funktion
1	7	D340 11	SR600	Steuerbit für REF600: 0 = REF600 ein 1 = REF600 aus
	6	12	-	-
	5	13	-	-
	4	14	-	-
	3	7	SP6	Hauptteiler DIVREF (D310) Bitwert im Teilerfaktor: 2^8
	2	6	SP5	-"- 2^7
	1	5	SP4	-"- 2^6
	0	4	SP3	-"- 2^5
0	7	D330 11	SP2	-"- 2^4
	6	12	SP1	-"- 2^3
	5	13	SP0	-"- 2^2
	4	14	SA1	Hilfsteiler DIVREF (D310) 2^1
	3	7	SA0	-"- 2^0
	2	6	SF2	Bruchteiler DIVREF (D310) 2^{-1}
	1	5	SF1	-"- 2^{-2}
	0	4	SF0	-"- 2^{-3}

7.7 Externe Schnittstellen

Pin	Name	Ein/Ausgang	Herkunft/Ziel	Wertebereich	Signalbeschreibung
X70.A1	EXTTUNE	Eingang	Rückwand TUNE	-10..10V	externe Tunespannung für TCXO (Steilheit typ. 0.1ppm/V)
X70.A10	OPTTUNE	Ausgang	A71,ROSC X22.16	0..12V	Tunespannung für ROSC
X70.A12	SERBUS-CLK	Eingang	A3,CPU X31.40	HCMOS-Pegel	Serbus-Clock
X70.A14 X70.A15	SERBUS-DAT	bidir.	A3,CPU X31.39	HCMOS-Pegel	Serbus-Daten
X70.A16	SERBUS-SYNC	Eingang	A3,CPU X31.37	HCMOS-Pegel	Serbus-Synchronisation
X70.A17	SERBUS-INT	Ausgang	A3,CPU X31.38	HCMOS-Pegel	Serbus-Interrupt
X70.A18	RES-P	Eingang	A3,CPU X31.28	HCMOS-Pegel	Serbus-Reset
X70.A19	DIAG-5V	Ausgang	A3,CPU X31,44	-5V...5V	Diagnose
X70.A22	VA24-P	Eingang	A2,POWS1	23.0...25.0V 4...20mA	Versorgungsspannung analog
X70.A24	VA15-P	Eingang	A2,POWS1	14.85V...15.75V 370...450mA	Versorgungsspannung analog
X70.A26	VA7.5-P	Eingang	A2,POWS1	7.45V...7.95V 600...750mA	Versorgungsspannung analog
X70.A28	VD5-P	Eingang	A2,POWS1	5.15V...5.25V 3...14mA	Versorgungsspannung digital
X70.A30	VA15-N	Eingang	A2,POWS1	-15.75V...-14.85V 120...250mA	Versorgungsspannung analog
X71	REF100	Ausgang	A6,FMOD X65	5±1dBm	Referenz 100MHz
X72	REF50	Ausgang	A8,DSYN X81	9±1dBm	Systemreferenz 50MHz (wird durchgeschleift)
X73	EXTREF	bidir.	Rückwand REF	7±1dBm 0.1..2V_{eff} (-13..13dBm)	Ausgang: Frequenzstandard 10MHz Eingang: ext. Fstd. 1..16MHz (Eingangsimpedanz 2000hm)
X74	OPTREF	Eingang	A71,ROSC X711	0..13dBm	Frequenzstandard ROSC 10MHz
X75	FSTEP	Ausgang	A9,SUM X97	6±1dBm	Stepfrequenz 103..117MHz
X77	REF600	Ausgang	A10,OPU1 X105	10±1dBm 13±1.2dBm	(Äi. 1..3) Referenz 600MHz (Äi. ab 4)

ROHDE&SCHWARZ

SERVICE INSTRUCTIONS SME

Reference/Step-Synthesis

1035.6501.02

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7. Checking and Repair of the Module

7.1 Functional Description

The Reference/Step-Synthesis Module consists of the two function units *Reference Frequencies* and *Step Synthesis*.

The function unit *Reference Frequencies* generates the required reference frequencies for the remaining synthesis and modulation boards in the instrument.

The function unit *Step Synthesis* supplies an output signal in the frequency range from 103 to 117MHz, the harmonics of which supply the coarse resolution of the synthesis.

7.1.1 Reference Frequencies

A low-noise 100-MHz crystal oscillator, which is connected to an internal or external frequency standard via a narrow-band PLL, is the nucleus of signal generation. Frequencies of 10, 50, 100 and 600MHz are generated by dividing, direct decoupling and multiplication.

7.1.1.1 Generation of 100MHz

The 100-MHz signal is generated in a conventional crystal oscillator (V5) with series resonant circuit. A second stage V35 amplifies the decoupled signal to approx. 17dBm.

The 100-MHz signal is distributed on the module via four gate stages as buffer amplifiers (V60, V70, V80, V90).

7.1.1.2 REFERENCE-PLL

The 100 MHz are divided by dividers down to 1MHz - the *reference frequency* at the phase detector (D525).

50 MHz are provided for the reference signal REF50 at X72 and 10 MHz for the output of the frequency standard EXTREF at X73.

The *reference signal* for the phase detector D525 is selected via the multiplexer D520 from IREF (TCXO), EREF (external source) and OREF (ROSC) via the control bits R0 and R1.

The subsequent programmable reference divider D510 divides the input frequencies which may vary between 1 and 16MHz to 1MHz.

The output pulses of the digital phase detector pass to a PI controller (N530 with circuitry), which controls the 100-MHz crystal VCO. The control bandwidth of the reference PLL is approx. 10Hz.

7.1.1.3 Frequency Standards and TUNING TCXO/ROSC

The output signal of the **TCXO** is supplied as TTL signal IREF to the multiplexer D520. The voltage supply to the TCXO is automatically switched off by the gate D535-D via the control bit R1, when the TCXO is not selected as frequency standard.

The frequency of the TCXO is fine-tuned via the D/A converter D555 (resolution: 12 bits) and the subsequent OPs N565 and N562. N562 adds an additional external tuning voltage (input EXTTUNE). OP N550 generates an exact and temperature-stable tuning voltage of 0 to 12 V at the output OPTTUNE for the option ROSC.

The 10-MHz signals of **ROSC** and **external frequency standards** pass via the inputs (OPTREF) and X73 (EXTREF) to the multiplexer D520 as TTL signals OREF and EREF.

Thus, the connector EXTREF (socket X73) adopts a bidirectional function. When the relay K1 is closed, it supplies a 10-MHz signal as frequency standard. When K1 is open, EXTREF functions as input for an external frequency standard (1 to 16 MHz).

7.1.1.4 Generation of 600MHz

600 MHz are generated from 100 MHz by means of connecting two differential amplifiers which work as triple amplifier and doubler in series.

Both multiplying stages are followed by steep bandpasses for selection of the wanted signal.

An inductive power divider (L271) distributes the 600-MHz signal onto the base stage V280 to the step synthesis and the emitter stage V285 to the output REF600.

The output signal REF600 can be decreased by approx. -40dB by means of the pin switch V290/V295 via the control bit SR600 (OP N290).

7.1.2 Step Synthesis

In the Step PLL, a VCO 103 to 117 MHz is down-converted with 100 MHz to 3 to 17 MHz and synchronized to the output signal (3 to 17 MHz) of a programmable divider.

7.1.2.1 600-MHz Divider DIVREF

The programmable ECL divider DIVREF (D310) divides the 600-MHz input signal by division factors of 17 to 100 with fractional dividers of min. 1/8.

The resulting output signal of 6 to 34 MHz is divided down to 3 to 17 MHz using the subsequent D flip-flop (D320). It is passed as *reference signal* SDIV for the Step-PLL via a lowpass to the phase detector N470.

7.1.2.2 Mixer and Buffer Amplifier

The *relational frequency ZFVCO* at the phase detector N470 is generated by down-converting the VCO frequency by 100 MHz. Part of the VCO output signal is routed via the RF stage (N430, N440) to the RF input of the mixer N380.

The LO input of N380 is controlled by the emitter stage V380 by 100 MHz and a level of approx. 16 dBm.

The differential band of 3 to 17 MHz at the IF output of N380 is passed as *relational frequency* ZFVCO via the IF stage N350 to the phase detector N470. The input and output lowpasses at N350 provide for the required suppression of the 100 MHz LO frequency and higher mixture products.

7.1.2.3 STEP-PLL CONTROLLER and RAMP CONTROL

The loop filter following N470 consists of a conventional PI controller (N465 with circuitry) and steep-edge lowpasses at the input and output. The control bandwidth of the loop is 350 kHz. The minimum output voltage VSVCO is limited by V475/V473 to approx. 0.5V.

Sudden frequency changes outside the lock-in range are realized using the analog frequency detector with subsequent ramp control. Analog measurement of the reference frequency (SDIV) and the relational frequency (ZFVCO) is carried out parallel with the phase detector and compared by the OpAmp N460. When a difference of approx. 300 kHz is exceeded, a constant current depending on the sign of the difference is impressed on the integration capacity C473 via the comparator N468-A/B and the analog switch D460-A/B. The voltage ramp thus generated at the output of N465 passes the step VCO to the lock-in range of the PLL and is there switched off again.
Settling must have been terminated after max. 100 µs.

7.1.2.4 STEP-VCO 103 to 117 MHz

The step VCO (V408) is a usual FET oscillator designed as drain circuit. V420 amplifies the signal to a specified level and routes it via a resistive power divider to the RF stage in the PLL and to the output stage V435 for the step frequency.

7.1.3 DATA TRANSMISSION and DIAGNOSTICS

The module is controlled via the serial interface SERBUS (D610). The diagnostic multiplexers are addressed via strobe 1, which also sets the operating mode of the reference PLL and the tuning voltage for TCXO/ROSC. The time-critical settings for the divider factor of the step PLL and control of the output REF600 are effected via strobe 2.

All output signals of the module as well as various internal signals for functional check and troubleshooting can be called via the diagnostics function.

The control voltages of the two VCOs - VQ100 and VSVCO - are monitored by window comparators (N680-A..D) with subsequent hysteresis loop (D680-A..D). An interrupt is triggered via IR0 and IR1 as soon as the loops lock out.

7.2 Measuring Equipment and Accessories

- Spectrum analyzer up to 1.2GHz (e.g., FSA).
- 50-Ω cable with test adaptor for RF test points
- Signal generator 1 to 16MHz, frequency accuracy $<10^{-6}$ (e.g., SMG).
- Oscilloscope with 100-MHz bandwidth (e.g., BOL).
- Digital storage oscilloscope for 7.4.10.2 (e.g., BOS).
- Multimeter (DC voltage accuracy ±4mV with 4V input voltage = ±0.1%, e.g., UDL44).
- Test voltage source 0 to 20V (e.g., NGT20).
- Service kit (1039.3520).

7.3 Troubleshooting

The subsequent error descriptions give only a rough survey.

Localization of errors generally requires signal tracing by means of the circuit diagram. Therefore, the operating points of the transistors and the RF levels have been noted down at the respective test points. The RF test points are DC voltage-free (except for TTL levels) and routed to connectors with ground connection via a 475-Ω resistor..

7.3.1 Reference Frequencies

Reference PLL does not lock in	Check reference PLL acc. to 7.4.3.1 Check input signals at the phase detector D525 via TPOINTs 203 and 204. Check the input OPTREF acc. to 7.4.3.3. Check 100-MHz crystal VCO acc. to 7.4.2.
No output of 10-MHz frequency standard	Check output EXTREF acc. to 7.4.3.2
Fine-tuning of TCXO/ROSC not possible	Make sure that the reference PLL works correctly acc. to 7.4.3.1. Check tuning acc. to 7.4.4.
No signal at REF50	Make sure via TPOINT 209 that the 100-MHz crystal VCO works correctly. Check output REF50 (TPOINT 207) acc. to 7.4.12.
No signal at REF100	Check output REF100 (TPOINT 209) acc. to 7.4.12. Check 100-MHz crystal VCO acc. to 7.4.2.
No signal at REF600	Make sure via TPOINT 209 that the 100-MHz crystal VCO works correctly. Check 300-MHz IF via TPOINT 206 and repeat adjustment acc. to 7.4.5.1, if required. Check output REF600 (TPOINT 210) acc. to 7.4.5.3 repeat adjustment acc. to 7.4.5.2 and 7.4.5.3, if required.
Output signals with extreme phase jitter	All output signals of the module have an extreme phase jitter in the AF range: replace 100-MHz crystal B20.

7.3.2 Step Synthesis

Step PLL does not lock in

Check LO signal at the phase detector N470 via TPOINT 213.
Check level of the 600-MHz input clock for divider D310 acc. to 7.4.5.3.

Check RF signal at the phase detector N470 via TPOINT 214.
Check level at the LO input of N380 acc. to 7.4.6.
Check step VCO acc. to 7.4.7.2.
Check RF level and IF level acc. to 7.4.8.

Continue troubleshooting as described under *Noise burst on step frequency*.

Noise burst on step frequency

The step frequency can be set, however, reveals a broad noise spectrum.

Check ramp control acc. to 7.4.9.

If no error was found with the above mentioned checks, the comparator N468, the analog switch D460, the phase detector N470 or the OP N465 may be faulty.

Repeat fine adjustment acc. to 7.4.10.1.

Settling problems with the step frequency

Lock-in procedure of the step PLL requires more than 100µs.

Check settling phase of the step PLL acc. to 7.4.10.3.
Readjust ramp control acc. to 7.4.10.1.

7.4 Checking and Adjustment

The individual test and adjustment procedures mentioned in this Section have to be carried out in the given order for complete adjustment of the module. Test and adjustment points are also mentioned with troubleshooting, Section 7.3.

The board covers which have to be mounted are noted down for each individual point.

RF frequency setting generally have to be carried out in CW mode (MODULATION OFF).

7.4.1 Data Transmission and Power Consumption

- Settings A: **UTILITIES/DIAG/TPOINT/STATE ON**
  /TEST POINT 202
  UTILITIES/REF OSC/SOURCE INT
  /ADJUSTMENT STATE ON
  /FREQUENCY ADJUSTMENT 2000

- Settings B: **UTILITIES/DIAG/TPOINT/STATE ON**
  /TEST POINT 213
  UTILITIES/REF OSC/SOURCE EXT
  /EXT FREQUENCY 7 MHz

▶ Check logic states using the table below:

	Subaddress 0			Subaddress 1	
Setting on the SME	D620 (Byte 0) 4 5 6 7 14	D630 (Byte 1) 4 5 6 7 14 12 11	SME setting FREQ	D330 (Byte 0) 4 5 6 7 14 13 12 11	D340 (Byte 1) 4 5 11
A	L H L H L	L H H L H L L	912 MHz	H H H L L L H H	L L H
B	H L H L H	H L L H L H H	877 MHz	L L L H H H L L	H L H
			88 MHz	L L L L L L L L	L H L

The high levels at D620 (Subaddress 0/Byte 0: Addressing of the diagnostic points) are not applied statically.
Bytes 3 and 4 of subaddress 0 (tuning voltage TCXO/ROSC) are not accessible via the hardware and are therefore checked with setting A via the diagnostic value indicated:
▶ TPOINT 202 = -6..-4V

Checking the power consumption:

- The power consumption of the module can be measured by means of soldering out the input inductors L100 to L104 and connecting an ammeter (rated values can be looked up in Section 7.7).

7.4.2 100-MHz CRYSTAL VCO

- Connect test voltage source with a tuning voltage of 7V to X541/X542 (X542=ground).
- Connect voltmeter to P10.
- Connect spectrum analyzer (span 0 to 500 MHz, ref. level 0dBm) to P40/P41 (P41=ground).

▶ Adjust voltage at P10 to minimum using L5.
▶ Set the voltage at P10 to the same value for both limits of the tuning voltages 1V and 13V such that the change of voltage at P10 becomes minimal across the tuning voltage range 1 to 13V.
▶ Absolute voltage at P10
across 1 to 13V tuning range = 10.2 to 11.2V
Voltage change at P10
across 1 to 13V tuning range < 0.2V

▶ Vary the tuning voltage between -1V and +1V:
The 100-MHz oscillation must not stop!

• Set tuning voltage to 7V

▶ Adjust the 100-MHz signal at P40 to -3dBm+/-0.3dBm.
▶ Check, if level at X71 (REF100) is 4 to 6dBm.

• *Plug jumper onto X540-X541 after removing the test-voltage source.*

7.4.3 REFERENCE-PLL for 100-MHz CRYSTAL VCO

7.4.3.1 Correct Function of the REFERENCE-PLL

• Settings: **UTILITIES/REF OSC/SOURCE INT**
/ADJUSTMENT STATE ON
/FREQUENCY ADJUSTMENT 2000

▶ Check TPOINT 201 = 2 to 12V

• Connect signal generator with 10MHz/-13dBm to REF (rear panel).

• Settings: **UTILITIES/REF OSC/SOURCE EXT**
/EXT FREQUENCY 10 MHz

• Vary the frequency of the signal generator according to the table below and check the control voltage via TPOINT 201:

Frequency in MHz	Rated value TPOINT 201	Error message on SME
10.000000	5 to 10V	-
10.000100 9.999900	<12V >2V	- -
10.000400 9.999600	>12.5V <-12.5V	Reference Frequency 100MHz VCXO unlocked Reference Frequency 100MHz VCXO unlocked

7.4.3.2 Output EXTREF

• Connect a spectrum analyzer (span 0 to 100 MHz, ref. level 10dBm) to REF (rear panel).

• Settings: **UTILITIES/REF OSC/SOURCE INT**

▶ Level of the 10-MHz frequency standard = 6..10dBm
Harmonics < -15dBc

7.4.3.3 Input OPTREF

This test instruction can only be executed, if the oven-controlled reference oscillator ROSC (option SM-B1) is fitted to the instrument.

- Settings: **UTILITIES/REF OSC/SOURCE INT**
  ADJUSTMENT STATE OFF

▶ Check TPOINT 201 = 2 to 12V

7.4.4 TUNING of TCXO/ROSC

7.4.4.1 Reference Adjustment for D/A Converter

- Connect a highly precise voltmeter to the output OPTTUNE. (motherboard connection: X70 A10). Make sure that there is good ground connection between the voltmeter and the module.

- Settings: **UTILITIES/DIAG/TPOINT/STATE ON**
  /TEST POINT 202
  UTILITIES/REF OSC/SOURCE INT
  /ADJUSTMENT STATE ON
  /FREQUENCY ADJUSTMENT 1333

▶ Adjust V_{OPTUNE} to 4.000V+/-4mV.
▶ Check voltages according to the table below:

Test point	Function of the signal	Rated value for FREQUENCY ADJUSTMENT 1333	Rated value for FREQUENCY ADJUSTMENT 2666
TPOINT 202	Output voltage DAC	-3.33V±0.3V	-6.66V±0.6V
X70 A10	Tuning voltage for ROSC	4V±0.004V	8V±0.010V
P580	Tuning voltage for TCXO	1.6V±0.1V	3.3V±0.2V

7.4.4.2 External Tuning Voltage

- Connect test-voltage source to the input TUNE (rear panel).
- Connect voltmeter to P580.

- Settings: **UTILITIES/REF OSC/SOURCE INT**
  /ADJUSTMENT STATE ON
  /FREQUENCY ADJUSTMENT 2000

- Set voltages of -10V, 0V and +10V:
▶ Check voltage at P580 acc. to the table below:

Test point	Function of the signal	External TUNE voltage	Rated value
P580	Tuning voltage for TCXO	-10V 0V +10V	2.18 to 2.30V 2.40 to 2.50V 2.60 to 2.72V

7.4.5 600-MHz Reference Signal REF600

The cover on the solder side must be fitted. Refer to 7.5!

7.4.5.1 Adjustment of 300-MHz Bandpass

- Settings: **UTILITIES/DIAG/TPOINT/STATE ON**
  /TEST POINT 206

▶ Adjust level at TPOINT 206 (ZF300) to maximum via
(1.) L230 (brass core),
(2.) L231 (ferrite core),
(3.) L234 (ferrite core),
(4.) L235 (brass core).
One adjustment per trimmer carried out in the above order is sufficient.

The cores must not be winded out of the coils and get lost (caution with turning counterclockwise!)

▶ Level at TPOINT 206 = 0.1V to 0.4V

7.4.5.2 Adjustment of 600-MHz Bandpass

- Connect spectrum analyzer (span 0 to 1GHz, ref. level 10dBm) at output socket REF600.

- Settings: **FREQ 90 MHz**
  UTILITIES/DIAG/TPOINT/STATE ON
  /TEST POINT 210

▶ Adjust level at TPOINT 210 (REF600) to maximum via
(1.) L265 (brass core),
(2.) L266 (brass core),
(3.) L267 (brass core),
(4.) L268 (brass core).
One adjustment per trimmer carried out in the above order is sufficient.

The cores must not be winded out of the coils and get lost (caution with turning counterclockwise!)

7.4.5.3 Adjustment of Level REF600

- Settings and test instruments as under 7.4.5.2.

▶ Adjust level to 11dBm+/-0.2dBm using R254.
(Module Revision 1 to 3)
▶ Adjust level to 14dBm+/-0.2dBm using R254. (Rev. from 4 up)
▶ Check level according to the table below:

Test point	Function of the signal	Rated value	Remark
X77 REF600	600-MHz reference frequency	11dBm±0.2dB 14dBm±0.2dB	Rev. 1 to 3 Rev. from 4 up
	600 MHz switched off	<-25dBm	Setting: FREQ < 93.75MHz Setting: FREQ >= 93.75MHz
TPOINT 210	600 MHz via diagnostics	0.2V to 0.6V	Setting: FREQ < 93.75MHz
P255	600-MHz clock for step divider	>-21dBm >-24dBm	Rev. 1 to 4 Rev. from 5 up Measure using a 50-Ω cable

7.4.6 LO-STAGE

- Connect a spectrum analyzer (span 90 to 110MHz, ref.level 0dBm) to P390/P391 (P391=ground, submodule K).

▶ Level at P390 = -10 to -6dBm

7.4.7 STEP VCO

7.4.7.1 Coarse Adjustment of the Tuning Range

- Connect a spectrum analyzer (span 90 to 130MHz, ref. level 10dBm) to the output socket X75 FSTEP.
- Connect test-voltage source to X406/X407 (X407=ground).

- Set tuning voltage to 18V.
▶ Adjust step frequency to 116 to 118MHz using L406.
- Set tuning voltage to 2V.
▶ Adjust step frequency to 102 to 103.5MHz using C400.

▶ Repeat adjustment using L406 and C400 until the frequencies mentioned above are adhered to.

7.4.7.2 Adjustment of FSTEP Level

- Set VCO frequency to 110MHz.

▶ Adjust level to 6dBm+/-0.4dBm using R412.

▶ Sweep the frequency from 103 to 117MHz:
Permitted level range at X75 FSTEP: 5.2dBm to 6.8dBm
Level deviation: < 0.8dB
Harmonics: < -20dBc

7.4.8 RF and IF STAGES

- Test-voltage source remains at X406. Set frequency of the step VCO to 110MHz.
- Connect a spectrum analyzer (span 100 to 120MHz, ref. level 0dBm) to P460/P461.

▶ Adjust level to -26dBm+/-0.2dBm using R441.

▶ Check level conditions in the above mentioned frequency range:

Test point	Function of the Signal	Rated value	Tuning voltage at X40
P460	RF signal 110MHz RF signal 103 to 117MHz	-26dBm±0.2dBm -27 to -24.5dBm, Variation <1.2dBm	approx. 10V approx. 2 to 18V
P360 (TPOINT 214)	IF signal 3 to 17MHz	-23dBm to -19dBm, Variation <2dBm	approx. 2 to 18V

7.4.9 Putting the RAMP CONTROL into Operation

- Test voltage source remains at X406. Set voltage to 16V.
- Connect voltmeter to P466/465 (P465=ground).
- Plug jumper onto X461-X462.

▶ Adjust voltage at P466 to 0V+/-5mV using R469.
▶ Sweep voltage at X406 from 2 to 18V:
Voltage at P466 (TPOINT 208) = -25mV to 25mV

- ***Subsequently, plug jumper onto X460-X461 and X405-X406.***

7.4.10 Locked STEP PLL

The cover on the solder side must be fitted. Refer to 7.5!

7.4.10.1 Fine Adjustment of the RAMP CONTROL

- Connect voltmeter to P466/465 (P465=ground).
- Settings: **UTILITIES/DIAG/TPOINT/STATE ON**
  /TEST POINT 208
  FREQ 820 MHz (FSTEP 115MHz)

▶ Adjust voltage at P466 to 0V+/-4mV using R469.

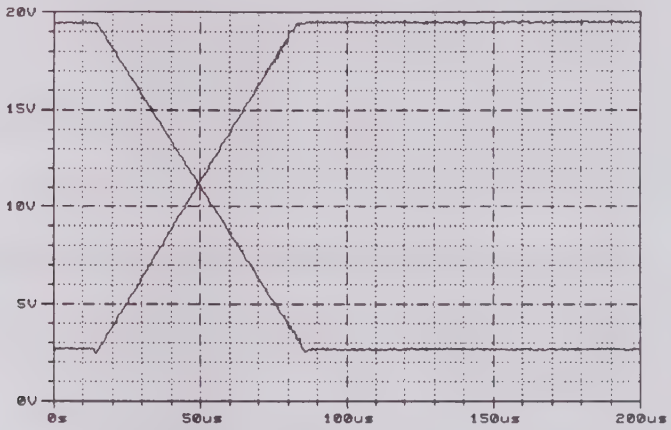
- Settings: **FREQ 943 MHz** (FSTEP 103.06MHz)
  FREQ 895 MHz (FSTEP 110.00MHz)
  FREQ 836 MHz (FSTEP 117.27MHz)

▶ The following applies for all three settings:
Voltage at P466 (TPOINT 208) = -10mV to 10mV

7.4.10.2 Transient behaviour of the STEP PLL

- Connect digital storage oscilloscope to X406/X407 (X407=ground).
- Settings: **SWEEP/FREQ/START FREQ 836MHz** (FSTEP 117.27MHz)
  /STOP FREQ 943MHZ (FSTEP 103.06MHz)
  /STEP LIN 107MHZ
  /DWELL 20ms
  /SPACING LIN
  /MODE AUTO

▶ The quality of the oscillogram should be as follows:



x-Axis: Time
y-Axis: Tuning Voltage Step VCO

The voltage characteristic of both frequency changes (103 to 117MHz, 117 to 103MHz) is simultaneously shown in the oscillogram. Since the board cover is not fitted, the level of the tuning voltage is slightly higher than the level in the adjusted state with cover fitted (103MHz/2V, 117MHz/18V).

▶ Subsequent to switching off the ramp, all settling procedures must have been finished after max. 100µs from start of the ramp.

7.4.10.3 Fine Adjustment of the VCO Tuning Range

Both board covers must be fitted. Refer to 7.5!

- Settings: **UTILITIES/DIAG/TPOINT/STATE ON**
  /TEST POINT 212

- Setting: **FREQ 834 MHz** (FSTEP 117.02MHz)
▶ Set V(TPOINT 212) to 18V±0.2V using L406.
- Setting: **FREQ 1149 MHz** (FSTEP 103.05MHz)
▶ Set V(TPOINT 212) to 2V±0.2V using C400.

▶ Repeat adjustment using L406 and C400 until the voltages required are obtained.

7.4.11 Spurious Signals of Mixer on FSTEP

Both board covers must be fitted. Refer to 7.5!

- Connect a spectrum analyzer to output FSTEP (X75).
- Connect reference output of the analyzer to REF.
- Settings: **UTILITIES/REF OSC/SOURCE EXT**
  /EXT FREQUENCY 10 MHz
- Set the following RF frequencies and measure the suppression of spurious signals at the given carrier offsets.

Settings	Step divider	Step frequency (Carrier frequency)	Carrier offset of mixer spuriae	Absolute frequency of the right mixer spuriae
FREQ 916 MHz	23.875	112.5654 MHz	523.56 kHz	113.0890 MHz
FREQ 928.8 MHz	21.125	114.2012 MHz	591.72 kHz	114.7929 MHz
FREQ 930.4 MHz	20.875	114.3713 MHz	598.80 kHz	114.9701 MHz
FREQ 833 MHz	17.875	116.7832 MHz	699.30 kHz	117.4825 MHz

▶ Suppression of spurious signals with the above mentioned carrier frequencies and frequency offsets: < -99dBc.

The suppression of spurious signals in the range of -100dBc can be measured by calibrating the analyzer to the carrier level, then overloading it by 10 dB and varying it by the frequency offset of the spurious signal. The span should be 10kHz. The noise level must be far below 100dBc (measure in AVERAGE mode, if required).

7.4.12 Signal Quality REF600, REF100, REF50

Both board covers must be fitted. Refer to 7.5!

▶ Check harmonics and secondary lines according to the table below:

Test point	Spectral Data	Rated value	Remark
X77 REF600	1st harmonic with 1.2GHz 100-MHz secondary lines Interference by divider spectrum Carrier offset 3.0457MHz	<-40dBc <-85dBc <-85dBc	Measuring range: 0 to 1GHz Setting: **FREQ 77.5MHz** (FSTEP 103.0457MHz) Measuring range: 595 to 605MHz
X71 REF100	Signal level 100MHz Harmonics Suppression of spurious signals	4 to 6dBm <-25dBc <-85dBc	particularly with 1, 10 and 50MHz offset
X72 REF50	Signal level 50MHz Harmonics Suppression of spurious signals	9..11.5dBm <-25dBc <-85dBc	particularly with 1 and 10 MHz offset

7.4.13 Diagnostic Points

The underlined values listed in the table are corrected automatically by means of the measured value of the diagnostic point 200.

TPOINT	Description	Rated value	Remark
200	10-kOhm reference impedance	-20mV to 20mV	for offset compensation
201	Control voltage of 100-MHz crystal VCO	2 to 12V	
202	Output of D/A converter for tuning-voltage	**-10.1 to 0.01V**	Value = ADJUSTMENT * (-2.5mV) V(OPTTUNE) = value * (-1.2) U(P580) = value * (-0.5)
203	1-MHz reference signal for reference PLL	1.8 to 5.2V	
204	1-MHz relational signal for reference PLL	2.0 to 3.0V	
205	Input/output of Frequency standard (EXTREF)	0.8 to 3.5	
206	300-MHz intermediate freq. in the multiplier	0.1 to 0.4V	
207	50-MHz output REF50	0.3 to 1.3V	Terminate by 50Ω.
208	Output voltage of frequency detector	**-40mV to 40mV**	Step PLL locked in
209	100-MHz output REF100	0.18 to 0.60V	Terminate by 50Ω.
210	600-MHz output REF600	0.2 to 0.6V -20mV to 20mV	RF frequency < 93.75MHz Terminate by 50Ω. RF frequency >= 93.75MHz
211	24V-supply voltage	22.5 to 25.5V	
212	Control voltage of step VCO	1 to 20V	
213	Output signal step divider	0.4 to 2.5V	
214	Down-converted VCO signal 3 to 17MHz	**0.10 to 0.25V**	
215	Output step frequency FSTEP 103 to 117MHz	0.2 to 0.6V	Terminate by 50Ω.

7.5 Removal and Assembly

Subsequent to opening the instrument, unlocking the boards and disconnecting the RF connections, the board can be taken out of its slot. Make sure, when removing the screening cover that the cover on the solder side is unscrewed/removed first. With assembly, the screening cover on the component side is the first to be fixed by screws. If this order is not adhered to, the threaded bolts on the board shrink and thus damage the threads of the screws on the component side.

7.6 Digital Interface

Board address: 20

Subaddress 0 (Strobe 1): static data

Byte	Bit	Latch/Pin	Name	Function
3	7 to 4	-	-	-
	3 to 0	D555	TV11 to TV8	Tuning voltage for TCXO/ROSC (MSB)
2	7 to 0	D555	TV7 to TV0	Tuning voltage for TCXO/ROSC (LSB)
1	7	D630 11	R1	Selection of **0** **1** **1**
	6	12	R0	frequency standard: **0** TCXO **0** ROSC **1** EXTREF
	5	13	-	-
	4	14	ENR0	Socket EXTREF **0** = input (1 to 16MHz) **1** = output (10MHz)
	3	7	NR3	Divider for frequency standard (MSB)
	2	6	NR2	in two's complement (1 to 16) ...
	1	5	NR1	-"- ...
	0	4	NR0	-"- (LSB)
0	7	D620 11	-	-
	6	12	-	-
	5	13	-	-
	4	14	END1	Selection **0** **1**
	3	7	END0	Diagnostic multiplexer: **1** MUX 1 (D650) **0** MUX 2 (D660)
	2	6	DA2	Addressing of the diagnostic point (MSB)
	1	5	DA1	-"- ...
	0	4	DA0	-"- (LSB)

Subaddress 1 (Strobe 2): dynamic data

Byte	Bit	Latch/Pin	Name	Function
1	7	D340 11	SR600	Control bit for REF600: **0** = REF600 on **1** = REF600 off
	6	12	-	-
	5	13	-	-
	4	14	-	-
	3	7	SP6	Main divider DIVREF (D310) Bit value in divider factor: 2^8
	2	6	SP5	-"- 2^7
	1	5	SP4	-"- 2^6
	0	4	SP3	-"- 2^5
0	7	D330 11	SP2	-"- 2^4
	6	12	SP1	-"- 2^3
	5	13	SP0	-"- 2^2
	4	14	SA1	Auxiliary divider DIVREF (D310) 2^1
	3	7	SA0	-"- 2^0
	2	6	SF2	Fractional divider DIVREF (D310) 2^{-1}
	1	5	SF1	-"- 2^{-2}
	0	4	SF0	-"- 2^{-3}

7.7 External Interfaces

Pin	Name	Input/Output	Origin/Destination	Specified range	Signal description
X70.A1	EXTTUNE	Input	Rear panel TUNE	-10 to 10V	external tuning voltage for TCXO (steepness typ. 0.1ppm/V)
X70.A10	OPTTUNE	Output	A71,ROSC X22.16	0..12V	Tuning voltage for ROSC
X70.A12	SERBUS-CLK	Input	A3,CPU X31.40	HCMOS level	Serbus clock
X70.A14 X70.A15	SERBUS-DAT	bidir.	A3,CPU X31.39	HCMOS level	Serbus data
X70.A16	SERBUS-SYNC	Input	A3,CPU X31.37	HCMOS level	Serbus synchronization
X70.A17	SERBUS-INT	Output	A3,CPU X31.38	HCMOS level	Serbus interrupt
X70.A18	RES-P	Input	A3,CPU X31.28	HCMOS level	Serbus reset
X70.A19	DIAG-5V	Output	A3,CPU X31,44	-5V to 5V	Diagnostics
X70.A22	VA24-P	Input	A2,POWS1	23.0 to 25.0V 4 to 20mA	Supply voltage, analog
X70.A24	VA15-P	Input	A2,POWS1	14.85V to 15.75V 370 to 450mA	Supply voltage, analog
X70.A26	VA7.5-P	Input	A2,POWS1	7.45V to 7.95V 600 to 750mA	Supply voltage, analog
X70.A28	VD5-P	Input	A2,POWS1	5.15V to 5.25V 3 to 14mA	Supply voltage, digital
X70.A30	VA15-N	Input	A2,POWS1	-15.75V to -14.85V 120 to 250mA	Supply voltage, analog
X71	REF100	Output	A6,FMOD X65	5±1dBm	100-MHz reference
X72	REF50	Output	A8,DSYN X81	9±1dBm	50-MHz system reference (connected through)
X73	EXTREF	bidir.	Rear panel REF	7±1dBm 0.1 to 2V_{rms} (-13 to 13dBm)	Output: Frequency standard 10MHz Input: ext. Fstd. 1 to 16MHz (Input impedance 200 Ohms)
X74	OPTREF	Input	A71,ROSC X711	0 to 13dBm	Frequency standard ROSC 10MHz
X75	FSTEP	Output	A9,SUM X97	6±1dBm	Step frequency 103 to 117MHz
X77	REF600	Output	A10,OPU1 X105	10±1dBm 13±1.2dBm	(Rev. 1 to 3) 600-MHz reference (Rev. from 4 up)

ROHDE&SCHWARZ

Schaltteillisten numerisch geordnet

Part lists in numerical order

Listes des pièces détachées par numéros de référence

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
B20	EQ 100,000MHZ5.0 LF08 CRYSTAL 100,000 MHZ	1036.4225.00	KVG	EQ0803.0680 SELEKT.	
C1	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C3	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C4	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C7	CC 15PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8750.00	AVX	1206 5 A 150 FATXA	
C8	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C10	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C15	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C20	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	PHILIPS_CO	2222 863 18229	
C21	CC 180PF+-1%50V NPO 1206 CHIP CAPACITOR	CC 0099.8844.00	AVX	1206 5 A 181 FAT2A	
C22	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	AVX	1206 5 A 121 F 3	
C23	CC 390PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8880.00	AVX	1206 5 A 391 F 3	
C30	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C32	CC 470PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8515.00	AVX	1206 5 A 471 F 3	
C33	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C38	CC 180PF+-1%50V NPO 1206 CHIP CAPACITOR	CC 0099.8844.00	AVX	1206 5 A 181 FAT2A	
C42	CC 12PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8744.00	AVX	1206 5A120 F 3	
C51	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C52	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C54	CC 18PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3622.00	MURATA	GRM39C0G***F50ZPT	
C55	CC 68PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.9746.00	MURATA	GRM39C0G***F50ZPT	
C56	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C65	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C67	CC 18PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3622.00	MURATA	GRM39C0G***F50ZPT	
C68	CC 68PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.9746.00	MURATA	GRM39C0G***F50ZPT	
C69	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C70	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C71	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	AVX	1206 5A 100 FAT	
C72	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C75	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C77	CC 18PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3622.00	MURATA	GRM39C0G***F50ZPT	
C78	CC 39PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.9730.00	MURATA	GRM39C0G***F50ZPT	
C79	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C82	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C85	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C87	CC 18PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3622.00	MURATA	GRM39C0G***F50ZPT	
C88	CC 68PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.9746.00	MURATA	GRM39C0G***F50ZPT	
C92	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C98	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C99	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C100	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C101	CC 470NF+-10%50V X7R 1812 CERAMIC CHIP CAPACITOR	CC 0007.7498.00	AVX	1812 5C 474KA T00F	
C103 ..105	CE 220UF +-20% 35V RM5 ELECTROLYTIC CAPACITOR	CE 0008.7904.00	PANASONIC	ECA 1 VFG 221 B	
C106	CE 100UF +-20% 63V RM5 ELECTROLYTIC CAPACITOR	CE 0008.7879.00	PANASONIC	ECA 1 JFG 101 B	
C107	CE 100UF+-20%16V RUND SMD SMD-ELECTOLYTIC CAPACIT.	CE 0009.6553.00	SANYO	16CV100F(G)S	
C108	CE 100UF+-20%16V RUND SMD SMD-ELECTOLYTIC CAPACIT.	CE 0009.6553.00	SANYO	16CV100F(G)S	
C158	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C200	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C204	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	PHILIPS_CO	2222 863 18101	
C206	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C207	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C211	CE 100UF +-20% 25V RM2.5 ELECTROLYTIC CAPACITOR	CE 0008.7891.00	PANASONIC	ECA-1EFG101I	
C212	CE 100UF+-20%16V RUND SMD SMD-ELECTOLYTIC CAPACIT.	CE 0009.6553.00	SANYO	16CV100F(G)S	
C218	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C219	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C221	CC 8,2PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8242.00	AVX	1206 5A8R2 C 3	
C222	CC 12PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8744.00	AVX	1206 5A120 F 3	
C223	CC 33PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3639.00	MURATA	GRM39C0G***B50ZPT	
C229	CC 4,7PF0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4538.00	MURATA	GRM39C0G***B50ZPT	
C230	CC 18PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3622.00	MURATA	GRM39C0G***F50ZPT	
C231	CC 18PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3622.00	MURATA	GRM39C0G***F50ZPT	
C232	CC 150PF+-1% 50V NPO 0603 MD-CERAMIC-CAPACITOR	CC 1051.4680.00	MURATA	GRM39C0G***F50ZPT	
C233	CC 56PF+-1% 50VNPO 0603 SMD CERAMIK CAPACITOR	CC 1093.6417.00	MURATA	GRM39C0G***F50ZPT	
C234	CC 18PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3622.00	MURATA	GRM39C0G***F50ZPT	
C235	CC 18PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3622.00	MURATA	GRM39C0G***F50ZPT	
C236	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C240	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	
C241	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C250	CC 3,3PF 0,1PF 50V NPO 06 SMD-CERAMIC-CAPACITOR	CC 0009.8285.00	MURATA	GRM39C0G***B50ZPT	
C251	CC 39PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.9730.00	MURATA	GRM39C0G***F50ZPT	
C252	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C253	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C254	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C255	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C256	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C257	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C258	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C260	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C261	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C262	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39COG***F50ZPT	
C263	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C264	CC 1,5PFO,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4450.00	MURATA	GRM39COG***B50ZPT	
C265	CC 2,7PFO,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.8291.00	MURATA	GRM39COG***B50ZPT	
C266	CC 3,9PFO,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4509.00	MURATA	GRM39COG***B50ZPT	
C267	CC 33PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3639.00	MURATA	GRM39COG***B50ZPT	
C268	CC 5,6PFO,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4521.00	MURATA	GRM39COG***B50ZPT	
C269	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39COG***B50ZPT	
C270	CC 3,9PFO,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4509.00	MURATA	GRM39COG***B50ZPT	
C271	CC 1,8PFO,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4473.00	MURATA	GRM39COG***B50ZPT	
C272	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C273	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C274	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C276	CC 6,8PFO,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.8262.00	MURATA	GRM39COG***B50ZPT	
C277	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39COG***F50ZPT	
C278	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C279	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C280	CC 2,7PFO,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.8291.00	MURATA	GRM39COG***B50ZPT	
C281	CC 3,3PF 0,1PF 50V NPO 06 SMD-CERAMIC-CAPACITOR	CC 0009.8285.00	MURATA	GRM39COG***B50ZPT	
C282	CE 1UF +-20% 50V RM2,5 ELECTROLYTIC CAPACITOR	CE 0008.7391.00	PHILIPS_CO	2222 116 71108	
C283	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C284	CC 1,5PFO,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4450.00	MURATA	GRM39COG***B50ZPT	
C285	CC 4,7PFO,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4538.00	MURATA	GRM39COG***B50ZPT	
C286	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C287	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C288	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39COG***F50ZPT	
C289	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39COG***B50ZPT	
C290	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C291	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C292	CC 27PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0010.9323.00	MURATA	GRM39COG***F50ZPT	
C293	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C294	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C295	CC 1PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8667.00	AVX	1206 5A 1RO CAT00J	
C296	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C297	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C298	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C299	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C311	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C312	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	AVX	1206 5A 100 FAT	
C313	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C315	CC 150PF+-1% 50V NPO 0603 MD-CERAMIC-CAPACITOR	CC 1051.4680.00	MURATA	GRM39COG***F50ZPT	
C319	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39COG***F50ZPT	
C320	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C321	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	
C322	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C323	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C324	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39COG***B50ZPT	
C325	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C326	CC 82PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 1097.6363.00	MURATA	GRM39COG***F50ZPT	
C327	CE 22UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.6253.00	PANASONIC	EEV HB 1V 220P	
C328 ..331	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C350	CC 56PF+-1% 50VNPO 0603 SMD CERAMIK CAPACITOR	CC 1093.6417.00	MURATA	GRM39COG***F50ZPT	
C351	CC 8,2PF0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4550.00	MURATA	GRM39COG***B50ZPT	
C352	CC 68PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.9746.00	MURATA	GRM39COG***F50ZPT	
C353	CC 68PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.9746.00	MURATA	GRM39COG***F50ZPT	
C354	CC 3,3NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8909.00	PHILIPS_CO	2238 581 16621	
C355	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C356	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C357	CC 15PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.8227.00	MURATA	GRM39COG***F50ZPT	
C358	CC 8,2PF0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4550.00	MURATA	GRM39COG***B50ZPT	
C359	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	
C360	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39COG***F50ZPT	
C361	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	AVX	1206 5A 100 FAT	
C362	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C363	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C366	CC 15PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.8227.00	MURATA	GRM39COG***F50ZPT	
C367	CC 180PF+-1% 50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 1097.6305.00	MURATA	GRM39COG***F50ZPT	
C368	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39COG***F50ZPT	
C380	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	
C381	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C382	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C383	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C384	CE 2,2UF +-10% 25V 6032 TANTALUM CHIP CAPACITOR	CE 0007.7223.00	SPRAGUE	293D 225 X9 025 C2W	
C385	CC 22PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4609.00	MURATA	GRM39COG***F50ZPT	
C386	CC 27PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0010.9323.00	MURATA	GRM39COG***F50ZPT	
C387	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	PHILIPS_CO	2222 863 18479	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C388	CC 33PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3639.00	MURATA	GRM39COG***B50ZPT	
C400	CT 1P-10P LUFTTR.KONZ. AIR TRIMMER	CT 0564.6885.00	TRONSER	60-0726-15010-901	
C401	CC 10PF+-2% 500V PELL CERAMIC CAPACITOR	CC 0580.9510.00	ATC	ATC100B 100 GW500XR	
C402	CC 4,7PF+-0,1PF500V PELL CAPACITOR	CC 0580.9540.00	ATC	ATC100B 4R7 BW500XR	
C404	CC 27PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0010.9323.00	MURATA	GRM39COG***F50ZPT	
C406	CC 22PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4609.00	MURATA	GRM39COG***F50ZPT	
C408	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C410	CE 4,7UF+-10% 10V 3528 TANTALUM CHIP CAPACITOR	CE 0007.7275.00	SPRAGUE	293D 475 X9 010 B2T	
C411	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C413	CC 82PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 1097.6363.00	MURATA	GRM39COG***F50ZPT	
C414	CC 33PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3639.00	MURATA	GRM39COG***B50ZPT	
C417	CC 18PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0048.3622.00	MURATA	GRM39COG***F50ZPT	
C418	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C420	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C421	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C423	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C424	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39COG***B50ZPT	
C431	CC 470PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8515.00	AVX	1206 5 A 471 F 3	
C432	CC 470PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8515.00	AVX	1206 5 A 471 F 3	
C434	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39COG***B50ZPT	
C435	CC 39PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.9730.00	MURATA	GRM39COG***F50ZPT	
C436	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C437	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C439	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C440	CC 470PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8515.00	AVX	1206 5 A 471 F 3	
C441	CC 470PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8515.00	AVX	1206 5 A 471 F 3	
C443	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C445	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C447	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C448	CC 3,9PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8207.00	AVX	1206 5 A 3R9 C 3	
C449	CC 12PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.8256.00	MURATA	GRM39COG***F50ZPT	
C450	CC 470PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8515.00	AVX	1206 5 A 471 F 3	
C453	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	AVX	1206 5A 100 FAT	
C454	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C455	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	
C457	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	AVX	1206 5A 221 FAT 2A	
C458	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C459	CC 6,8PF+-0,1PF500V PELL CERAMIC CAPACITOR	CC 0007.8565.00	ATC	100B 6R8BW 500XR	
C460	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C461	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C462	CC 1,8NF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.7423.00	AVX	1206 5A 182 F 3	
C463	CC 6,8PF+-0,1PF500V PELL CERAMIC CAPACITOR	CC 0007.8565.00	ATC	100B 6R8BW 500XR	
C464	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	PHILIPS_CO	2222 863 18101	
C465	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	
C467	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C468	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	PHILIPS_CO	2222 863 18101	
C469	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	
C470	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C471	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C472	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	PHILIPS_CO	2222 863 18101	
C473	CK 68NF+-5%63V RD2,5H7MKT POLYESTER CAPACITOR	CK 0099.2923.00	SIEMENS	B 32 529-A683-J	
C474	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	AVX	1206 5 C 222 KA 3	
C475	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C476	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C477	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	AVX	1206 5 C 222 KA 3	
C478	CE 10UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.5605.00	PANASONIC	EEV HB 1V 100X	
C479	CE 10UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.5605.00	PANASONIC	EEV HB 1V 100X	
C480	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C481	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	AVX	1206 5A 221 FAT 2A	
C482	CC 22PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4609.00	MURATA	GRM39C0G***F50ZPT	
C483 ..485	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C486	CC 4,7PF0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4538.00	MURATA	GRM39C0G***B50ZPT	
C487	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C488	CC 270PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8867.00	AVX	1206 5A 271 F 3	
C489	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C491	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C492	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C500	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C501	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C510	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C511	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C513	CC 39PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.9730.00	MURATA	GRM39C0G***F50ZPT	
C514	CC 15PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8750.00	AVX	1206 5 A 150 FATXA	
C515	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C516	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C517	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	
C519	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C524	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C525	CC 180PF+-1% 50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 1097.6305.00	MURATA	GRM39C0G***F50ZPT	
C526	CC 10P+-0,1PF50V NPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4567.00	MURATA	GRM39C0G***B50ZPT	
C530	CC 680PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.7375.00	AVX	1206 5A 681 F 3	
C531	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C532	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C535	CC 680PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.7375.00	AVX	1206 5A 681 F 3	
C536	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C537	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C538	CE 1UF+-20%100V ALU-CHIP SMD-ELECTROLYTIC CAPACIT.	CE 0008.1787.00	VALVO	2222 139 69108	
C539	CE 1UF+-20%100V ALU-CHIP SMD-ELECTROLYTIC CAPACIT.	CE 0008.1787.00	VALVO	2222 139 69108	
C540	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C541	CE 2,2UF+-20%50V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.6524.00	PANASONIC	EEV HB 1H 2R2R	
C542	CK 2,2UF+-5% 50V RD7,2H13 POLYESTER CAPACITOR	CK 0350.5944.00	SIEMENS	B32529-C5225-J089	
C543	CK 1UF+-5%50V7,5X5,5X10,5 POLYESTER CAPACITOR	CK 0099.2998.00	SIEMENS	B32529-C5105-J189	
C544 ..548	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C552	CE 1UF+-20%100V ALU-CHIP SMD-ELECTROLYTIC CAPACIT.	CE 0008.1787.00	VALVO	2222 139 69108	
C555 ..557	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C558	CC 15PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8750.00	AVX	1206 5 A 150 FATXA	
C560	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C561	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C562	CK 2,2UF+-5% 50V RD7,2H13 POLYESTER CAPACITOR	CK 0350.5944.00	SIEMENS	B32529-C5225-J089	
C563	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C564	CE 2,2UF+-20%50V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.6524.00	PANASONIC	EEV HB 1H 2R2R	
C565	CE 10UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.5605.00	PANASONIC	EEV HB 1V 100X	
C566	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C567	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C570	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C574	CC 680PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.7375.00	AVX	1206 5A 681 F 3	
C575	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C576	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	AVX	12065A102FAT2A(4A)	
C577	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C578	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C579	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C580	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C582	CE 1UF +-10% 25V 3528 TANTALUM CHIP CAPACITOR	CE 0007.7217.00	SPRAGUE	293D 105 X9 025 B2T	
C595	CC 10NF+-10% 50VHDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4844.00	MURATA	GRM39X7R***K50C500	
C609	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	PHILIPS_CO	2238 581 16627	
C610	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C620	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C621	CE 22UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.6253.00	PANASONIC	EEV HB 1V 22OP	
C650	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C660	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C680	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C685	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C688	CE 22UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.6253.00	PANASONIC	EEV HB 1V 22OP	
C690	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C691	CC 100NF+-10%16V HDK 0603 CERAMIC CHIP CAPACITOR	CC 1097.6292.00	TDK	C1608X7R1C104KT	
C695	CC 100PF+-1% 50VNPO 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4680.00	MURATA	GRM39C0G***F50ZPT	
C697	CC 1,0NF+-10%50V HDK 0603 SMD-CERAMIC-CAPACITOR	CC 0009.4938.00	MURATA	GRM39X7R***K50C500	
C698	CC 470PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8515.00	AVX	1206 5 A 471 F 3	
C900	CE 22UF+-20%35V RUND SMD SMD ELECTROLYTIC CAPACIT.	CE 0009.6253.00	PANASONIC	EEV HB 1V 22OP	
C901	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
D31	BG SH100E3008 DIVREF ASIC IC GATEARRAY	BG 1039.1240.00	SIEMENS	SH100E3008	
D95	BL 74AC74SC 2XD-FLIPFL DUAL D-TYPE FLIP FLOP	BL 0820.3602.00	FAIRCHILD	74AC74SC	
D320	BL 74ACT74M 2XRSFLIPFLOP DUAL D-TYPE FLIP FLOP	BL 0008.0680.00	TEXAS_INST	(SN/CD)74ACT74D	
D330	BL 74HC4094T 8ST.SH.REG 8-STAGE SHIFT&STORE REG.	BL 0804.0977.00	PHILIPS_SE	(PC)74HC4094(D/T)	
D340	BL 74HC4094T 8ST.SH.REG 8-STAGE SHIFT&STORE REG.	BL 0804.0977.00	PHILIPS_SE	(PC)74HC4094(D/T)	
D430	BL 74AC00SC 4XNAND2 QUAD NAND GATE	BL 0820.3477.00	FAIRCHILD	74AC00SC	
D445	BL 74AC00SC 4XNAND2 QUAD NAND GATE	BL 0820.3477.00	FAIRCHILD	74AC00SC	
D460	BS DG441DY 4X ANALOGSCH QUAD ANALOG SWITCH	1036.4454.00	SILICONIX	DG441DY	
D500	BL 74AC161SC 4B.BIN CNT 4BIT SYNC.PRES.BIN COUNT.	BL 0820.3519.00	NSC	74AC161(SC)	
D505	BL 74AC00SC 4XNAND2 QUAD NAND GATE	BL 0820.3477.00	FAIRCHILD	74AC00SC	
D510	BL PC74HC161T 4B.BIN.CNT BINARY COUNTER	BL 0804.0983.00	PHILIPS_SE	(PC)74HC161(D/T)	
D515	BL PC74HC390T 2XDEC.CNT DUAL DECADE COUNTER	BL 0007.5043.00	PHILIPS_SE	(PC)74HC390(D/T)	
D520	BL PC74HC153T 2X4IN.MUX DUAL MULTIPLEXER	BL 0007.5008.00	PHILIPS_SE	(PC)74HC153(D/T)	
D525	BL 74HC74D/T 2X D-FF DUAL D-TYPE FLIPFLOP	0007.3505.00	PHILIPS_SE	(PC)74HC74D(T)	
D535	BL 74AC00SC 4XNAND2 QUAD NAND GATE	BL 0820.3477.00	FAIRCHILD	74AC00SC	
D550	BL 74HC00T 4XNAND2 QUAD 2INPUT NAND GATE	BL 0007.3463.00	PHILIPS_SE	(PC)74HC00D(T)	
D555	BJ DAC8143FS 1X12B-DAC 12B SERIAL D/A-CONVERTER	1012.9510.00	PMI	DAC8143FS	
D600	BL 74HCT125T 4XBUFF. 3S QUAD LINE DRIVER	BL 0007.5395.00	PHILIPS_SE	(PC)74HCT125(D/T)	
D610	BG TH3032.1C SERBUSD ASIC IC GATE ARRAY	BG 0008.6143.00	THESYS	TH3032.1C	
D620	BL 74HC4094T 8ST.SH.REG 8-STAGE SHIFT&STORE REG.	BL 0804.0977.00	PHILIPS_SE	(PC)74HC4094(D/T)	
D630	BL 74HC4094T 8ST.SH.REG 8-STAGE SHIFT&STORE REG.	BL 0804.0977.00	PHILIPS_SE	(PC)74HC4094(D/T)	
D640	BL 74HC14T 6XINV.SCHM HEXINV.SCHMITT-TRIGGER	BL 0007.4018.00	PHILIPS_SE	(PC)74HC14(D/T)	
D650	BL 74HC4051T 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0007.3592.00	PHILIPS_SE	(PC)74HC4051(D/T)	
D660	BL 74HC4051T 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0007.3592.00	PHILIPS_SE	(PC)74HC4051(D/T)	
D680	BL 74HC132T 4XSCHMITT T QUAD 2-INP NAND SCHMITT	BL 0520.7811.00	PHILIPS_SE	(PC)74HC132(D/T)	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
K1	SR 5V 500 OHM 1X1 SIL RELAY 5V SIL	1012.9604.00	HAMLIN	HE3621A0500	
L1	LD 10UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L2	LD 4,7UH 10% 0,15A 1210 RF CHOKE	LD 0008.1687.00	SIEMENS	B82422-A1472-J(K)100	
L3	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L5	LD 142NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9559.00	COMPONEX	E 558 CN-10 0025	
L15	LD 180NH 10%0,120HM 1,12A CHOKE TRIMMWERT/SELECTED	LD 0067.2770.00	DALE	IM2	
L20	LD 370NH 9,5W CM14P FE-K COIL	0620.7629.00	TOKO	E521HN-090023	
L30	LD 0,82UH10%0,850HMO,420A CHOKE	LD 0067.2857.00	DALE	IM2	
L33	LD 10UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L35	LD 170NH 5,5W CM15P FE-K COIL+CORE	0801.4859.00	TOKO	E521 HN-050023	
L50	LD 2,7UH 10%0,550HMO,355A CHOKE	LD 0067.2911.00	DALE	IM2	
L55	LD 150NH 10% 0,10HM 1,23A CHOKE	LD 0067.2763.00	DALE	IM2	
L65	LD 150NH 10% 0,10HM 1,23A CHOKE	LD 0067.2763.00	DALE	IM2	
L73	LD 2,7UH 10%0,550HMO,355A CHOKE	LD 0067.2911.00	DALE	IM2	
L75	LD 150NH 10% 0,10HM 1,23A CHOKE	LD 0067.2763.00	DALE	IM2	
L85	LD 150NH 10% 0,10HM 1,23A CHOKE	LD 0067.2763.00	DALE	IM2	
L96	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L97	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L98	LD 1UH 10% 0,38A 1210 RF CHOKE	LD 6006.0130.00	SIEMENS	B82422-A1102-J(K)100	
L100	LD 3,3UH BEI 1,63A0,160HM CHOKE	LD 0026.4061.00	DALE	IM 6	
L101	LD 15UH 10% 1R2 0,46A CHOKE	LD 0026.4149.00	DALE	IM 6	
L102	LD 4,7UH 10%1,20HM 0,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L103	LD 4,7UH BEI 1,35A0,240HM CHOKE	LD 0026.4084.00	DALE	IM 6	
L104	LD 4,7UH 10%1,20HM 0,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L107	LD 1,20UH10%0,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L108	LD 4,7UH 10%1,20HM 0,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L109	LD 4,7UH BEI 1,35A0,240HM CHOKE	LD 0026.4084.00	DALE	IM 6	
L110	LD 4,7UH 10%1,20HM 0,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L206	LD 38NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9442.00	COMPONEX	E 558 AN-10 0041	
L209	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L210	LD 10UH BEI 0,81A 0,660HM CHOKE	LD 0026.4126.00	DALE	IM 6	
L211	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L215	LD 2,2UH 10%0,40HM 0,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L216	LD 10UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L230	LD 29NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9420.00	COMPONEX	E 558 AN-10 0040	
L231	LD 32NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9436.00	COMPONEX	E 558 CN-10 0020	
L234	LD 32NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9436.00	COMPONEX	E 558 CN-10 0020	
L235	LD 29NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9420.00	COMPONEX	E 558 AN-10 0040	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
L251	LD 91NH SMD Q5,1H5 O-K SMD-VHF-COIL	0008.9520.00	COMPONEX	E 558 HN-10 0100	
L253	LD 0,56UH10%0,500HM0,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L256	LD 0,56UH10%0,500HM0,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L260	LD 10UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L261	LD 1UH 10% 0,38A 1210 RF CHOKE	LD 6006.0130.00	SIEMENS	B82422-A1102-J(K)100	
L262	LD 220NH 10% 0,28A 1210 RF CHOKE	LD 0520.7911.00	SIEMENS	B82422-A3221-J(K)100	
L265 ..268	LD 29NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9420.00	COMPONEX	E 558 AN-10 0040	
L271	LU HF-UEBERTR. 50-1700MHZ RF TRANSFORMER	1036.4590.00	COMPONEX	616DB-1017	
L275	LD 32NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9436.00	COMPONEX	E 558 CN-10 0020	
L277	LD 56NH SMD Q5,1H5 O-K SMD-VHF-COIL	0008.9471.00	COMPONEX	E 558 GN-10 0028	
L278	LD 270NH 10%0,160HM0,975A CHOKE	LD 0067.2792.00	DALE	IM2	
L280	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L281	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L282	LD 32NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9436.00	COMPONEX	E 558 CN-10 0020	
L285	LD 38NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9442.00	COMPONEX	E 558 AN-10 0041	
L286	LD 56NH SMD Q5,1H5 O-K SMD-VHF-COIL	0008.9471.00	COMPONEX	E 558 GN-10 0028	
L288	LD 0,47UH10%0,350HM0,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L290	LD 32NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9436.00	COMPONEX	E 558 CN-10 0020	
L291	LD 1UH 10% 0,38A 1210 RF CHOKE	LD 6006.0130.00	SIEMENS	B82422-A1102-J(K)100	
L292	LD 1UH 10% 0,38A 1210 RF CHOKE	LD 6006.0130.00	SIEMENS	B82422-A1102-J(K)100	
L320	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L322	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L324	LD 220NH 10%0,140HM1,045A CHOKE	LD 0067.2786.00	DALE	IM2	
L325	LD 0,82UH10%0,850HM0,420A CHOKE	LD 0067.2857.00	DALE	IM2	
L326	LD 1,5UH 10%0,220HM 0,56A CHOKE	LD 0067.2886.00	DALE	IM2	
L330	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L350	LD 10UH 10% 0,18A 1210 RF CHOKE	LD 0007.9255.00	SIEMENS	B82422-A1103-J(K)100	
L351	LD 10UH 10% 0,18A 1210 RF CHOKE	LD 0007.9255.00	SIEMENS	B82422-A1103-J(K)100	
L352	LD 0,33UH10%0,220HM0,830A CHOKE	LD 0067.2805.00	DALE	IM2	
L353	LD 270NH 10%0,160HM0,975A CHOKE	LD 0067.2792.00	DALE	IM2	
L359	LD 47UH 10% 0,08A 1210 RF CHOKE	LD 0008.1693.00	SIEMENS	B82422-A1473-J(K)100	
L360	LD 0,39UH10%0,300HM0,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L361	LD 0,33UH10%0,220HM0,830A CHOKE	LD 0067.2805.00	DALE	IM2	
L380	LD 220NH 10%0,140HM1,045A CHOKE	LD 0067.2786.00	DALE	IM2	
L381	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L382	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L383	LD 220NH 10%0,140HM1,045A CHOKE	LD 0067.2786.00	DALE	IM2	
L384	LD 220NH 10%0,140HM1,045A CHOKE	LD 0067.2786.00	DALE	IM2	
L387	LD 120NH 10% 0,090HM 1,3A CHOKE	LD 0067.2757.00	DALE	IM2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
L388	LD 120NH 10% 0,090HM 1,3A CHOKE	LD 0067.2757.00	DALE	IM2	
L390	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L391	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L392	LD 2,2UH 10%0,40HM 0,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L393	LD 2,2UH 10%0,40HM 0,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L394	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L395	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L402	LD 3,3UH 10%0,850HM0,285A CHOKE	LD 0067.2928.00	DALE	IM2	
L405	LD 3,3UH 10%0,850HM0,285A CHOKE	LD 0067.2928.00	DALE	IM2	
L406	LD 180NH 4,5W CM14P FE-K CHOKE	0303.9024.00	TOKO	301-SS-0400	
L408	LD 3,3UH 10%0,850HM0,285A CHOKE	LD 0067.2928.00	DALE	IM2	
L410	LD 1,20UH10%0,180HM0,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L415	LD 10UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L418	LD 0,39UH10%0,300HM0,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L420	LD 10UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L421	LD 90NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9513.00	COMPONEX	E 558 CN-10 0023	
L435	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L436	LD 220NH 10%0,140HM1,045A CHOKE	LD 0067.2786.00	DALE	IM2	
L437	LD 0,39UH10%0,300HM0,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L438	LD 0,56UH10%0,500HM0,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L439	LD 0,33UH10%0,220HM0,830A CHOKE	LD 0067.2805.00	DALE	IM2	
L442	LD 38NH SMD-ABGL.Q5,1H5 SMD-VHF-COIL	0008.9442.00	COMPONEX	E 558 AN-10 0041	
L448	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L450	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L463	LD 680UH 10% 600HM 0,030A CHOKE	LD 0067.3201.00	DALE	IM-2	
L464	LD 680UH 10% 600HM 0,030A CHOKE	LD 0067.3201.00	DALE	IM-2	
L466	LD 4,7UH 10% 0,15A 1210 RF CHOKE	LD 0008.1687.00	SIEMENS	B82422-A1472-J(K)100	
L467	LD 680UH 10% 600HM 0,030A CHOKE	LD 0067.3201.00	DALE	IM-2	
L468	LD 680UH 10% 600HM 0,030A CHOKE	LD 0067.3201.00	DALE	IM-2	
L470	LD 47UH 10% 4,50HM 0,11A CHOKE	LD 0067.3060.00	DALE	IM2	
L475	LD 4,7UH 10%1,20HM 0,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L476	LD 10UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L480	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L500	LD 1UH 10% 0,38A 1210 RF CHOKE	LD 6006.0130.00	SIEMENS	B82422-A1102-J(K)100	
L510	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L511	LD 0,39UH10%0,300HM0,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L513	LD 0,33UH10%0,220HM0,830A CHOKE	LD 0067.2805.00	DALE	IM2	
L519	LD 1UH 10% 0,38A 1210 RF CHOKE	LD 6006.0130.00	SIEMENS	B82422-A1102-J(K)100	
L525	LD 1,8UH 10% 0,30HM 0,48A CHOKE	LD 0067.2892.00	DALE	IM2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
L526	LD 1,5UH 10%0,220HM 0,56A CHOKE	LD 0067.2886.00	DALE	IM2	
L550	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L551	LD 1UH 10% 0,38A 1210 RF CHOKE	LD 6006.0130.00	SIEMENS	B82422-A1102-J(K)100	
L552	LD 4,7UH 10% 0,15A 1210 RF CHOKE	LD 0008.1687.00	SIEMENS	B82422-A1472-J(K)100	
L553	LD 1UH 10% 0,38A 1210 RF CHOKE	LD 6006.0130.00	SIEMENS	B82422-A1102-J(K)100	
L558	LD 4,7UH 10% 0,15A 1210 RF CHOKE	LD 0008.1687.00	SIEMENS	B82422-A1472-J(K)100	
L565	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L575	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L576	LD 1UH 10% 0,38A 1210 RF CHOKE	LD 6006.0130.00	SIEMENS	B82422-A1102-J(K)100	
L580	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L620	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L621	LD 10UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L630	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
L650	LD 2,2UH 10% 0,27A 1210 RF CHOKE	LD 0520.7870.00	SIEMENS	B82422-A1222-J(K)100	
N100	BO LM2941T LOWDROP +VREGL VOLTAGE REGULATOR	4024.5989.00	NSC	LM2941T	
N290	BO NE5534D OPAMP OPERATIONAL AMPLIFIER	0815.7555.00	SIGNETICS	NE5534(D)	
N350	BM MSA1105 0.5-1.3G MMIC MICROWAVE MONOLITHIC AMPL	1051.4051.00	AVANTEK	MSA-1105-TR1	
N380	BM SRA-1H MIXER 0.5GHZ MIXER	BM 0252.5234.00	MINI-CIRCU	SRA-1H	
N430	BM MSA1105 0.5-1.3G MMIC MICROWAVE MONOLITHIC AMPL	1051.4051.00	AVANTEK	MSA-1105-TR1	
N440	BM MSA1105 0.5-1.3G MMIC MICROWAVE MONOLITHIC AMPL	1051.4051.00	AVANTEK	MSA-1105-TR1	
N460	BO LT1124CS8 2X VF OPAMP VOLTAGE FEEDBACK OPAMP	1036.4483.00	LINEAR_TEC	(LT)1124(CS8)	
N465	BO AD829JR HISPEED OPAMP LOW-NOISE HIGH-SPEED AMP	BO 1036.4254.00	ANALOG_DEV	AD829JR	
N468	BO LP365M 4X COMP IC COMPARATOR	1036.4248.10	NSC	LP365M	
N470	BM RMS-1 MIXER 500M MIXER MODULE	0846.4393.00	MINI-CIRCU	RMS-1	
N530	BO NE5534D OPAMP OPERATIONAL AMPLIFIER	0815.7555.00	SIGNETICS	NE5534(D)	
N550	BO OP97FS LP PREC OPAMP LOW POWER OPAMP	1036.4390.00	PMI	OP97F(S)	
N562	BO OP97FS LP PREC OPAMP LOW POWER OPAMP	1036.4390.00	PMI	OP97F(S)	
N565	BO OP97FS LP PREC OPAMP LOW POWER OPAMP	1036.4390.00	PMI	OP97F(S)	
N570	EO 10MHZ-QU.OSZ VTCXO 5V OSCILLATOR VTCXO	1039.3113.00	MILLIREN	453-0210	
N585	BO REF01CS 10V 20MA VREF VOLTAGE REFERENCE	1002.5129.00	PMI	REF01C(S)	
N680	BO LP365M 4X COMP IC COMPARATOR	1036.4248.10	NSC	LP365M	
P10	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P40	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P41	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P200	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P201	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P220	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P221	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
P250	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P251	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P255	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P256	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P265	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P266	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P325	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P326	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P360	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P361	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P390	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P391	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P450	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P451	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P460	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P461	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P465	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P466	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P520	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P525	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P575	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P576	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
P580	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
R1	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	DRALORIC	CR 1206	
R2	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R4	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	ROEDERSTEI	D25	
R6	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	DRALORIC	CR 1206	
R7	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	DRALORIC	CR 1206	
R8	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	DRALORIC	CR 1206	
R10	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	DRALORIC	CR 1206	
R11	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R15	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R16	RG 3,32KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5789.00	ROEDERSTEI	D25	
R17	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R21	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R22	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R30	RG 3,32KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5789.00	ROEDERSTEI	D25	
R31	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R35	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R36	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	DRALORIC	CR 1206	
R38	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R40	RG 15,0 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5450.00	ROEDERSTEI	D25	
R42	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R47 ..49	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R50	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	DRALORIC	CR 1206	
R53	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R56	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R57	RG 47R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6924.00	DRALORIC	CR 0603	
R58	RG 121 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9498.00	PHILIPS_CO	RC 22 H	
R59	RG 182 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9130.00	PHILIPS_CO	RC 22 H	
R65	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	DRALORIC	CR 1206	
R67	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R68	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R69	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R71	RG 47R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6924.00	DRALORIC	CR 0603	
R72	RG 121 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9498.00	PHILIPS_CO	RC 22 H	
R73	RG 182 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9130.00	PHILIPS_CO	RC 22 H	
R75	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	DRALORIC	CR 1206	
R77	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R80	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R81	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R82	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R83	RG 182 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9130.00	PHILIPS_CO	RC 22 H	
R85	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	DRALORIC	CR 1206	
R87	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R89	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R91	RG 121 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9498.00	PHILIPS_CO	RC 22 H	
R92	RG 220R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6953.00	YAGEO	RC0603	
R93	RG 182 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9130.00	PHILIPS_CO	RC 22 H	
R94	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R96	RG 47R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6924.00	DRALORIC	CR 0603	
R97	RG 6K8 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7037.00	PHILIPS_CO	RC 22 H	
R98	RG 150R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6947.00	ROEDERSTEI	D11 0603	
R99	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R100	RG 5,11KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0729.00	ROEDERSTEI	D25	
R101	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R103	RL 0,60W 1,21KOHM+-1%TK50 RESISTOR	RL 0083.0655.00	RESISTA	MK2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R105	RG 27,4 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5508.00	DRALORIC	CR 1206	
R200	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R201	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	DRALORIC	CR 1206	
R202	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R204	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R206 ..208	RG 27,4 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5508.00	DRALORIC	CR 1206	
R209	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R210	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R212	RL 0,60W 392 OHM+-1%TK50 RESISTOR	RL 0082.2183.00	PHILIPS_CO	MRS 25	
R213	RL 0,60W 392 OHM+-1%TK50 RESISTOR	RL 0082.2183.00	PHILIPS_CO	MRS 25	
R217	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R223	RG 47OR +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6976.00	ROEDERSTEI	D11 0603	
R240	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R241	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R249	RG 18R2 +-1% TK100 0603 SMD RESISTOR EIA0603	0010.8385.00	PHILIPS_CO	RC 22 H	
R250	RG 47OR +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6976.00	ROEDERSTEI	D11 0603	
R251	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	DRALORIC	CR 1206	
R252	RG 301R +-1%TK100 0603 SMD RESISTOR EIA0603	0009.9123.00	PHILIPS_CO	RC 22 H	
R253	RG 301R +-1%TK100 0603 SMD RESISTOR EIA0603	0009.9123.00	PHILIPS_CO	RC 22 H	
R254	RS 0,25W500 OHM+-20% SMD POTENTIOMETER	RS 0007.9603.00	BOURNS	3314G--1-	
R255	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R256	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R257	RG 27,4 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5508.00	DRALORIC	CR 1206	
R258	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	DRALORIC	CR 1206	
R259	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R260	RG 27,4 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5508.00	DRALORIC	CR 1206	
R261	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	ROEDERSTEI	D25	
R262	RG 82,5 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9052.00	YAGEO	RC0603	
R263	RG 47OR +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6976.00	ROEDERSTEI	D11 0603	
R264	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	ROEDERSTEI	D25	
R265	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R266	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R267	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R269	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R270	RG 200R +-1% TK100 0603 SMD RESISTOR EIA0603	1097.6386.00	PHILIPS_CO	RC 22 H	
R271	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	DRALORIC	CR 1206	
R272	RG 47R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6924.00	DRALORIC	CR 0603	
R273	RG 27OR +-1% TK100 0603 SMD RESISTOR EIA0603	0010.9581.00	PHILIPS_CO	RC 22 H	
R274	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation		Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R275	RG 221 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5614.00	ROEDERSTEI	D25	
R276	RG 18R2 +-1% TK100 SMD RESISTOR EIA0603	0603	0010.8385.00	PHILIPS_CO	RC 22 H	
R277	RG 150 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5589.00	ROEDERSTEI	D25	
R278	RG 4R75 +-1% TK250 SMD RESISTOR EIA0603	0603	0010.8379.00	PHILIPS_CO	RC 22 H	
R279	RG 182 OHM+-1%TK100 SMD RESISTOR EIA0603	0603	0009.9130.00	PHILIPS_CO	RC 22 H	
R280	RG 1KO +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5340.00	DALE	CRCW 0603	
R281	RG 8,25OHM+-1%TK100 CHIP-RESISTOR	1206	RG 0007.8488.00	ROEDERSTEI	D25	
R282	RG 47OR +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6976.00	ROEDERSTEI	D11 0603	
R283	RG 47,5 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5566.00	DRALORIC	CR 1206	
R284	RG 47,5 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5566.00	DRALORIC	CR 1206	
R285	RG 33R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6918.00	YAGEO	RC0603	
R286	RG 825R +-1% TK100 SMD RESISTOR EIA0603	0603	0010.8391.00	PHILIPS_CO	RC 22 H	
R287	RG 560R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.9630.00	PHILIPS_CO	RC 22 H	
R288	RG 33,2KOHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5914.00	DALE	CRCW 1206G...F-T	
R289	RG 5,62KOHM+-1%TK100 CHIP RESISTOR	1206	RG 0007.0735.00	ROEDERSTEI	D25	
R290	RG 10,0KOHM+-1%TK100 RG CHIP RESISTOR	1206	RG 0007.0793.00	DRALORIC	CR 1206	
R291	RG 10,0KOHM+-1%TK100 RG CHIP RESISTOR	1206	RG 0007.0793.00	DRALORIC	CR 1206	
R292	RG 6,81KOHM+-1%TK100 CHIP RESISTOR	1206	RG 0007.0758.00	DRALORIC	CR 1206	
R293	RG 100 OHM+-1%TK100 CHIP RESISTOR	1206	RG 0006.8884.00	ROEDERSTEI	D25	
R294	RG 392R+-1% TK100 SMD RESISTOR EIA0603	0603	0010.9300.00	PHILIPS_CO	RC 22 H	
R295	RG 392 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5672.00	DRALORIC	CR 1206	
R296	RG 680R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6982.00	PHILIPS_CO	RC 22 H	
R297	RG 39,2KOHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5937.00	PHILIPS_CO	RC02	
R298	RG 680R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6982.00	PHILIPS_CO	RC 22 H	
R299	RG 680R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6982.00	PHILIPS_CO	RC 22 H	
R309	RG 56,2 OHM+-1%TK100 CHIP RESISTOR	1206	RG 0006.8826.00	ROEDERSTEI	D25	
R310	RG 1KO +-1% TK100 CHIP RESISTOR	1206	RG 0006.7271.00	DRALORIC	CR 1206	
R311	RG 1KO +-1% TK100 CHIP RESISTOR	1206	RG 0006.7271.00	DRALORIC	CR 1206	
R312	RG 4K75 +-1% TK100 RESISTOR CHIP	1206	RG 0007.5820.00	DRALORIC	CR 1206	
R313	RG 511 OHM+-1%TK100 CHIP RESISTOR	1206	RG 0006.9051.00	DRALORIC	CR 1206	
R314	RG 511 OHM+-1%TK100 CHIP RESISTOR	1206	RG 0006.9051.00	DRALORIC	CR 1206	
R315	RG 47R +-1% TK100 SMD RESISTOR EIA0603	0603	0009.6924.00	DRALORIC	CR 0603	
R316 ..318	RG 4K75 +-1% TK100 RESISTOR CHIP	1206	RG 0007.5820.00	DRALORIC	CR 1206	
R319	RG 33,2 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5520.00	ROEDERSTEI	D25	
R320	RG 182 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5595.00	ROEDERSTEI	D25	
R321	RG 182 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5595.00	ROEDERSTEI	D25	
R322	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R323	RG 10K +-1% TK100 SMD RESISTOR EIA0603	0603	RG 0009.5357.00	DRALORIC	CR 0603	
R324	RG 475 OHM+-1%TK100 RESISTOR CHIP	1206	RG 0007.5695.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R325	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R326	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R327	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R328	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R329	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R330	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R331	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R333	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	DRALORIC	CR 1206	
R334	RG 3,01KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5772.00	ROEDERSTEI	D25	
R335	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R336	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R337	RG O-OHM WIDERSTAND 1206 RESISTOR CHIP O-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R338	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R339	RG O-OHM WIDERSTAND 1206 RESISTOR CHIP O-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R341 ..343	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R350	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	DRALORIC	CR 1206	
R351	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R352	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R355	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R357	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R360	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R362	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R363	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R380	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	DRALORIC	CR 1206	
R381	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	DRALORIC	CR 1206	
R382	RG 330R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6960.00	ROEDERSTEI	D11 0603	
R383	RG 182 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9130.00	PHILIPS_CO	RC 22 H	
R384	RG 825R +-1% TK100 0603 SMD RESISTOR EIA0603	0010.8391.00	PHILIPS_CO	RC 22 H	
R385	RG 10R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5328.00	YAGEO	RC0603	
R388	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R400	RG O-OHM WIDERSTAND 1206 RESISTOR CHIP O-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R401	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R405	RG 392R+-1% TK100 0603 SMD RESISTOR EIA0603	0010.9300.00	PHILIPS_CO	RC 22 H	
R406	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	DRALORIC	CR 1206	
R407	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R411	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R412	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R414	RS 0,25W200 OHM+-20% SMD POTENTIOMETER	RS 0007.9590.00	BOURNS	3314G--1-	
R415	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R416	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R417	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	DRALORIC	CR 1206	
R418	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R419	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R422	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R424	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R425	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	DRALORIC	CR 1206	
R426	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	DRALORIC	CR 1206	
R427	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R428	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R429	RG 39,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5543.00	ROEDERSTEI	D25	
R430	RG 39,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5543.00	ROEDERSTEI	D25	
R431	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R432	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R433	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R434	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	DRALORIC	CR 1206	
R435	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R436	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R437	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R438	RG 51,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8810.00	DRALORIC	CR 1206	
R439	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	ROEDERSTEI	D25	
R440	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	DRALORIC	CR 1206	
R441	RS 0,25W200 OHM+-20% SMD POTENTIOMETER	RS 0007.9590.00	BOURNS	3314G--1-	
R442	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R443	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R444	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R445	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R446	RG 10R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5328.00	YAGEO	RC0603	
R447	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	DRALORIC	CR 1206	
R448	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R449	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R450	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R451	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R452	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R453	RG 56,2KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1883.00	ROEDERSTEI	D25	
R454	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	DRALORIC	CR 1206	
R455	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R456	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R457	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R458	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	DRALORIC	CR 1206	
R459	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R460	RG 470R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6976.00	ROEDERSTEI	D11 0603	
R461	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	DRALORIC	CR 1206	
R462	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R463	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	DRALORIC	CR 1206	
R464	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R465	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R466	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	DRALORIC	CR 1206	
R467	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R468	RG 301 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5643.00	ROEDERSTEI	D25	
R469	RS 0,25W 50 OHM+-20% SMD POTENTIOMETER	RS 0007.9578.00	BOURNS	3314G--1-	
R470	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R471	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	DRALORIC	CR 1206	
R472	RG 1K5 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6999.00	DRALORIC	CR 0603	
R473	RG 82,5 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9052.00	YAGEO	RC0603	
R474	RG 7K5 +-1% TK100 0603 SMD RESISTOR EIA0603	0010.8440.00	PHILIPS_CO	RC 22 H	
R475	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R476	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R477	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R478	RG 330K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7114.00	PHILIPS_CO	RC 22 H	
R479	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R480	RG 8K25 +-1% TK100 0603 SMD RESISTOR EIA0603	0010.8456.00	YAGEO	RC0603	
R481	RG 121 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9498.00	PHILIPS_CO	RC 22 H	
R482	RG 121 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9498.00	PHILIPS_CO	RC 22 H	
R483	RG 8K25 +-1% TK100 0603 SMD RESISTOR EIA0603	0010.8456.00	YAGEO	RC0603	
R484	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	ROEDERSTEI	D25	
R485	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R486 ..488	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	ROEDERSTEI	D25	
R489	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R490	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R491	RG O-OHM WIDERSTAND 1206 RESISTOR CHIP O-OHM	RG 0007.5108.00	DRALORIC	CR 1206	
R492	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R493	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	DRALORIC	CR 1206	
R494	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R495	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	DRALORIC	CR 1206	
R496	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R497	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R498 ..506	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R507	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R509	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R510	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R511	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R512	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R513	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R514	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R515	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R516	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R517	RG 825 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.7259.00	ROEDERSTEI	D25	
R518	RG 560R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.9630.00	PHILIPS_CO	RC 22 H	
R519	RG 270R +-1% TK100 0603 SMD RESISTOR EIA0603	0010.9581.00	PHILIPS_CO	RC 22 H	
R520 ..523	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R524	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R525	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R526	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R527	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R528	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R529	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R530	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R531	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R533	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R535	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R536	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R540	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	DRALORIC	CR 1206	
R541	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R542	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	DRALORIC	CR 1206	
R543	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R544	RG 1,0MOHM+-1%TK100 1206 CHIP RESISTOR	RG 0815.7532.00	ROEDERSTEI	D 25	
R545	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R546	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R547	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R548	RG 3,01KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5772.00	ROEDERSTEI	D25	
R550	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R551	RG 10,0KOH+-0,1%TK25 1206 SMD-RESISTOR	0009.7666.00	DRALORIC	M25TK25....0.1% 1206	
R552	RG 12,0KOH+-0,1%TK25 1206 SMD-RESISTOR	0009.7620.00	PHILIPS_CO	MPC 01	
R553	RG 100 OHM+-0,1%TK25 1206 SMD-RESISTOR	0009.8033.00	PHILIPS_CO	MPC 01	
R554	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	DRALORIC	CR 1206	
R555	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R556	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R558 ..560	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R561	RG 20,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5866.00	ROEDERSTEI	D25	
R562	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R563	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R564	RG 27,4 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5508.00	DRALORIC	CR 1206	
R565	RG 162 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8932.00	DRALORIC	CR 1206	
R566	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R567	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R568	RG 3,01KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5772.00	ROEDERSTEI	D25	
R569	RG 1KO +-1% TK100 1206 CHIP RESISTOR	RG 0006.7271.00	DRALORIC	CR 1206	
R570	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R571	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R572	RL 0,40W 56 OHM2% UNGEW. RESISTOR	RL 0092.5927.00	DRALORIC	SMA 0204	
R573	RG 470R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6976.00	ROEDERSTEI	D11 0603	
R574	RG 470R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6976.00	ROEDERSTEI	D11 0603	
R575	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R576	RG 100 OHM+-0,1%TK25 1206 SMD-RESISTOR	0009.8033.00	PHILIPS_CO	MPC 01	
R577	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R578	RG 6K8 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7037.00	PHILIPS_CO	RC 22 H	
R579	RG 270R +-1% TK100 0603 SMD RESISTOR EIA0603	0010.9581.00	PHILIPS_CO	RC 22 H	
R580	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R581	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R582	RG 6K8 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7037.00	PHILIPS_CO	RC 22 H	
R583	RG 121 OHM+-1%TK100 0603 SMD RESISTOR EIA0603	0009.9498.00	PHILIPS_CO	RC 22 H	
R584	RG 39,2KOH+-0,1%TK25 1206 SMD-RESISTOR	0009.8027.00	PHILIPS_CO	MPC 01	
R587	RG 0-OHM WIDERSTAND 0603 SMD RESISTOR EIA0603	0009.9369.00	DRALORIC	CRCW 0603 0 OHM	
R588	RS 0,25W 5KOHM +-20% SMD POTENTIOMETER	RS 0007.9632.00	BOURNS	3314G--1-	
R589	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R590	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	DRALORIC	CR 1206	
R591	RG 33K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7066.00	PHILIPS_CO	RC 22 H	
R592	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R593	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R597	RG 27K4 +-1% TK100 0603 SMD RESISTOR EIA0603	1097.6392.00	PHILIPS_CO	RC 22 H	
R598	RG 27K4 +-1% TK100 0603 SMD RESISTOR EIA0603	1097.6392.00	PHILIPS_CO	RC 22 H	
R599	RG 1KO +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5340.00	DALE	CRCW 0603	
R600 ..602	RG 47R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6924.00	DRALORIC	CR 0603	
R603	RG 100R +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5334.00	DRALORIC	CR 0603	
R604	RG 470R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6976.00	ROEDERSTEI	D11 0603	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R605	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R607	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R608	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R610	RG 470R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6976.00	ROEDERSTEI	D11 0603	
R611	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	ROEDERSTEI	D25	
R612 ..614	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	DRALORIC	CR 1206	
R615	RG 470R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6976.00	ROEDERSTEI	D11 0603	
R616	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R619	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	DRALORIC	CR 1206	
R620	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R629	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R630	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R631	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R632	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R633	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R634	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R635	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R636	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R638	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R639	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R640 ..642	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R643	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R644	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R645	RG 4K75 +-1% TK100 1206 RESISTOR CHIP	RG 0007.5820.00	DRALORIC	CR 1206	
R649	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R650	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R652	RG 470R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6976.00	ROEDERSTEI	D11 0603	
R653	RG 47R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6924.00	DRALORIC	CR 0603	
R659	RG 15K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7043.00	PHILIPS_CO	RC 22 H	
R660	RG 10K +-1% TK100 0603 SMD RESISTOR EIA0603	RG 0009.5357.00	DRALORIC	CR 0603	
R661	RG 47K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7072.00	ROEDERSTEI	D11 0603	
R662	RG 6K8 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7037.00	PHILIPS_CO	RC 22 H	
R680	RG 39K2 +-1% TK100 0603 SMD RESISTOR EIA0603	0010.9823.00	PHILIPS_CO	RC 22 H	
R681	RG 11,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0806.00	DRALORIC	CR 1206	
R682	RG 330R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6960.00	ROEDERSTEI	D11 0603	
R685	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R687	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R688	RG 121K +-1% TK100 0603 SMD RESISTOR EIA0603	1097.6340.00	PHILIPS_CO	RC 22 H	
R690	RG 221 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6004.00	DRALORIC	CR 1206	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R691	RG 12K1 +-1% TK100 0603 SMD RESISTOR EIA0603	0010.8462.00	YAGEO	RC0603	
R692	RG 470R +-1% TK100 0603 SMD RESISTOR EIA0603	0009.6976.00	ROEDERSTEI	D11 0603	
R693	RG 68K +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7089.00	PHILIPS_CO	RC 22 H	
R694	RG 4K7 +-1% TK100 0603 SMD RESISTOR EIA0603	0009.7020.00	DRALORIC	CR 0603	
R697	RG 3,3MOHM+-5%TK200 1206 CHIP RESISTOR	0007.9990.00	ROEDERSTEI	D 25	
R698	RG 1,0MOHM+-1%TK100 1206 CHIP RESISTOR	RG 0815.7532.00	ROEDERSTEI	D 25	
V5	AK BFR93A NPN 12V 35MA 6 GHZ WIDEBAND TRANSISTOR	AK 0007.7030.00	VALVO	BFR93A	
V10	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V14	AE BB909B 25/ 3PF CDI TUNING DIODE	AE 0092.9600.00	PHILIPS	BB909B	
V35	AK BFR96TS N 15V 100MA TRANSISTOR	AK 1035.6630.00	VISHAY	BFR96TS	
V60	AM SST310 N-D 25V JFET N-CHANNEL JUNCTION-FET	1036.4577.00	SILICONIX	SST310-T1	
V69	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V70	AM SST310 N-D 25V JFET N-CHANNEL JUNCTION-FET	1036.4577.00	SILICONIX	SST310-T1	
V80	AM SST310 N-D 25V JFET N-CHANNEL JUNCTION-FET	1036.4577.00	SILICONIX	SST310-T1	
V90	AM SST310 N-D 25V JFET N-CHANNEL JUNCTION-FET	1036.4577.00	SILICONIX	SST310-T1	
V95	AK BSV52 N 12V 100MA NPN SWITCHING TRANSISTOR	AK 0007.3434.00	PHILIPS	BSV52	
V103	AE BZX79B15 2% 0.5W ZDI ZENER DIODE	AE 0008.7610.00	PHILIPS_SE	BZX79B15	
V105	AL BD439 NPN 60V 4A0 TRANSISTOR	AL 0010.1645.00	SGS-THOMSO	BD439	
V205	AK BFG97 NPN 15V 100MA 5 GHZ WIDEBAND TRANSISTOR	AK 0008.1741.00	PHILIPS	BFG97	
V206	AK BFG97 NPN 15V 100MA 5 GHZ WIDEBAND TRANSISTOR	AK 0008.1741.00	PHILIPS	BFG97	
V240	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V255	AK BFG97 NPN 15V 100MA 5 GHZ WIDEBAND TRANSISTOR	AK 0008.1741.00	PHILIPS	BFG97	
V260	AK BFG97 NPN 15V 100MA 5 GHZ WIDEBAND TRANSISTOR	AK 0008.1741.00	PHILIPS	BFG97	
V262	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V263	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V265	AK BSR13 N 30V 800MA SWITCHING TRANSISTOR	AK 0007.2209.00	VALVO	BSR 13	
V279	AE 1N4696 9V1 0.3W ZDI ZENER DIODE	0303.9160.00	SEMITRONIC	1N4696	
V280	AK BFG97 NPN 15V 100MA 5 GHZ WIDEBAND TRANSISTOR	AK 0008.1741.00	PHILIPS	BFG97	
V285	AK BFG97 NPN 15V 100MA 5 GHZ WIDEBAND TRANSISTOR	AK 0008.1741.00	PHILIPS	BFG97	
V290	AE BAR14-1 DUAL 100V PIN PIN DIODE	AE 0820.3283.00	SIEMENS	BAR14-1 (-A772)	
V295	AE BAR14-1 DUAL 100V PIN PIN DIODE	AE 0820.3283.00	SIEMENS	BAR14-1 (-A772)	
V299	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V320	AK BSR12 P 15V 100MA PNP SWITCHING TRANSISTOR	AK 0007.2067.00	PHILIPS_SE	BSR12	
V321	AK BSR12 P 15V 100MA PNP SWITCHING TRANSISTOR	AK 0007.2067.00	PHILIPS_SE	BSR12	
V322	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V323	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V325	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V361	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V380	AK BFR93A NPN 12V 35MA 6 GHZ WIDEBAND TRANSISTOR	AK 0007.7030.00	VALVO	BFR93A	
V383	AE 1N4691 6V2 0.3W ZDI ZENER DIODE	0568.1220.00	AMERICAN_P	1N4691	
V400	AE BBY40 30/05PF VHF-CDI VHF VARIABLE CAPAC. DIODE	0007.2109.00	VALVO	BBY40	
V401	AE BB620 45/3PF CDI TUNING DIODE	0848.5251.10	SIEMENS	BB620	
V402	AE BB620 45/3PF CDI TUNING DIODE	0848.5251.10	SIEMENS	BB620	
V403	AE BBY40 30/05PF VHF-CDI VHF VARIABLE CAPAC. DIODE	0007.2109.00	VALVO	BBY40	
V404	AE BBY40 30/05PF VHF-CDI VHF VARIABLE CAPAC. DIODE	0007.2109.00	VALVO	BBY40	
V405	AE BB620 45/3PF CDI TUNING DIODE	0848.5251.10	SIEMENS	BB620	
V406	AE BB620 45/3PF CDI TUNING DIODE	0848.5251.10	SIEMENS	BB620	
V407	AE BBY40 30/05PF VHF-CDI VHF VARIABLE CAPAC. DIODE	0007.2109.00	VALVO	BBY40	
V408	AM SST310 N-D 25V JFET N-CHANNEL JUNCTION-FET	1036.4577.00	SILICONIX	SST310-T1	
V418	AE BZV55/C5V1 0.5W ZDI ZENER DIODE	AE 0006.9839.00	PHILIPS_SE	BZV55B5V1 (GEG)	
V420	AK BFS17 N 15V 25MA 1 GHZ WIDEBAND TRANSISTOR	AK 0010.6460.00	VALVO	BFS17	
V422	AE BZV55/C5V1 0.5W ZDI ZENER DIODE	AE 0006.9839.00	PHILIPS_SE	BZV55B5V1 (GEG)	
V424	AE BZV55/C5V1 0.5W ZDI ZENER DIODE	AE 0006.9839.00	PHILIPS_SE	BZV55B5V1 (GEG)	
V425	AE HSMS2800 SCHOTTKY SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V426	AE HSMS2800 SCHOTTKY SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V435	AK BFQ81 NPN 16V 30MA 280MW TRANSISTOR	AK 0920.1717.10			
V437	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V460	AE BZV55/C5V1 0.5W ZDI ZENER DIODE	AE 0006.9839.00	PHILIPS_SE	BZV55B5V1 (GEG)	
V466	AE HSMS2813 2XSCHOTTKY SCHOTTKY DIODE	AE 0824.3542.00	HEWLETT_PA	HSMS2813 L31	
V473	AE HSMS2800 SCHOTTKY SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V475	AK BSR13 N 30V 800MA SWITCHING TRANSISTOR	AK 0007.2209.00	VALVO	BSR 13	
V514	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V518	AK BSV52 N 12V 100MA NPN SWITCHING TRANSISTOR	AK 0007.3434.00	PHILIPS	BSV52	
V530	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V531	AE BZV55/C4V7 0.5W ZDI ZENER DIODE	AE 0006.9822.00	PHILIPS	BZV55B4V7	
V535	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V536	AE BZV55/C4V7 0.5W ZDI ZENER DIODE	AE 0006.9822.00	PHILIPS	BZV55B4V7	
V540	AE HSMS2800 SCHOTTKY SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V555	AE BZV55/C10 0,5W ZDI ZENER DIODE	AE 0006.9880.00	PHILIPS_SE	BZV55C10	
V566	AD BAS32 75V UDI HIGH-SPEED DIODE	AD 0006.7288.00	PHILIPS	BAS32 (L)	
V570	AE BZV55/C5V6 0.5W ZDI ZENER DIODE	AE 0006.9845.00	PHILIPS	BZV55B5V6	
V571	AE HSMS2800 SCHOTTKY SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V575	AE BZV55/C3V9 0,5W ZDI ZENER DIODE	0006.9816.00	PHILIPS_SE	BZV55B3V9	
V582	AK BSV52 N 12V 100MA NPN SWITCHING TRANSISTOR	AK 0007.3434.00	PHILIPS	BSV52	
V583	AE HSMS2800 SCHOTTKY SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V584	AE HSMS2800 SCHOTTKY SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V585	AK BSV52 N 12V 100MA NPN SWITCHING TRANSISTOR	AK 0007.3434.00	PHILIPS	BSV52	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V586	AK BSV52 N 12V 100MA NPN SWITCHING TRANSISTOR	AK 0007.3434.00	PHILIPS	BSV52	
V587	AE HSMS2810 SCHOTTKY SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS-2810	
V590	AK BSV52 N 12V 100MA NPN SWITCHING TRANSISTOR	AK 0007.3434.00	PHILIPS	BSV52	
V660	AE BZV55/C5V6 0.5W ZDI ZENER DIODE	AE 0006.9845.00	PHILIPS	BZV55B5V6	
V697	AE HSMS2800 SCHOTTKY SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V698	AE HSMS2800 SCHOTTKY SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
W1	DX KABEL W1	1035.6599.00			
X70	FP STECKERLEISTE 32POL. CONNECTOR 32P.	FP 0008.5718.00	DEUT_ELCO	16 8457 064 002 027	
X71 ..75	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X77	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X330	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
X331	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
X405 ..407	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
X460 ..462	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
X540 ..542	VL EINPRESSSTIFT 5,6 PIN	VL 0010.7250.00	AMP	1-928776-5	
Z1	LD T-FILTER 3,3NF SMD SMD-FILTER	1039.1362.00	MURATA	NFM61R20T332T1	
Z95	LD T-FILTER 3,3NF SMD SMD-FILTER	1039.1362.00	MURATA	NFM61R20T332T1	
Z100 ..104	LD T-FILTER 3,3NF SMD SMD-FILTER	1039.1362.00	MURATA	NFM61R20T332T1	
Z210	LD T-FILTER 3,3NF SMD SMD-FILTER	1039.1362.00	MURATA	NFM61R20T332T1	
Z280	LD T-FILTER 3,3NF SMD SMD-FILTER	1039.1362.00	MURATA	NFM61R20T332T1	
Z382	LD T-FILTER 3,3NF SMD SMD-FILTER	1039.1362.00	MURATA	NFM61R20T332T1	
Z384	LD T-FILTER 3,3NF SMD SMD-FILTER	1039.1362.00	MURATA	NFM61R20T332T1	
Z390 ..392	LD T-FILTER 3,3NF SMD SMD-FILTER	1039.1362.00	MURATA	NFM61R20T332T1	
Z550	LD T-FILTER 3,3NF SMD SMD-FILTER	1039.1362.00	MURATA	NFM61R20T332T1	
Z560	LD T-FILTER 3,3NF SMD SMD-FILTER	1039.1362.00	MURATA	NFM61R20T332T1	
Z600 ..604	LD T-FILTER 100PF SMD SMD-FILTER	1039.1356.00	MURATA	NFM61R00T101T1	
Z605	LD T-FILTER 3,3NF SMD SMD-FILTER	1039.1362.00	MURATA	NFM61R20T332T1	
Z650	LD T-FILTER 100PF SMD SMD-FILTER	1039.1356.00	MURATA	NFM61R00T101T1	

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ROHDE&SCHWARZ

XY-Liste

XY List

Erklärung der Spaltenbezeichnungen:

el. Kennz.	**Bauelement-Kennzeichen**
Seite	**Leiterplatten-Seite, auf der sich das Bauelement befindet**
X/Y	**Koordinaten (in Millimeter) des Bauelementes auf der Leiterplatte bezogen auf den Nullpunkt**
Planq., Bl.	**Planquadrat und Seite des Schaltbildes für das jeweilige Bauelement**

Explanation of column designations:

Part	**Identification of instrument part**
Side	**Side of the PC board on which instrument part is positioned**
X/Y	**Coordinates (in units of millimeters) of the component on the PC board in reference to zero point**
Sqr, Pg	**Square and page of the diagram for the respective instrument part**

Service-Relevante Bauteile / Service-Relevant Components

Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg
B20	B	29	126	3D	2	N100	B	91	63	4B	2	P575	B	88	97	12F	6
C400	B	182	58	7D	5	N380	B	164	99	11E	4	P576	B	88	95	12F	6
D31A	B	231	43	4D	4	N570	B	73	114	10E	6	P580	B	82	141	10E	6
D610	B	130	52	5F	7	P10	B	25	107	2E	2	R254	B	284	114	6C	3
K1-A	B	57	23	8C	6	P40	B	23	77	5D	2	R414	B	184	39	8C	5
K1-B				8C	6	P41	B	25	77	5D	2	R441	B	154	61	10E	5
L5	B	37	107	2E	2	P200	B	199	133	2E	3	R469	B	262	95	2D	5
L20	B	38	120	4D	2	P201	B	199	135	2E	3	R588	B	98	138	6E	6
L35	B	22	87	5E	2	P220	B	226	139	3E	3	X70A	B	189	11	7D	6
L206	B	214	133	3E	3	P221	B	226	142	3E	3	X70B	B	189	11	2C	2
L230	B	240	132	4D	3	P250	B	281	142	5E	3	X71	B	17	15	9C	2
L231	B	250	119	4E	3	P251	B	284	142	5E	3	X72	B	29	15	12E	2
L234	B	253	125	4D	3	P255	B	272	48	11E	3	X73	B	42	15	7C	6
L235	B	258	138	5D	3	P256	B	272	50	11E	3	X74	B	55	15	7B	6
L251	B	280	136	5D	3	P265	B	273	111	7E	3	X75	B	245	15	12C	5
L265	B	291	98	8E	3	P266	B	273	114	7E	3	X77	B	271	15	12C	3
L266	B	275	91	8F	3	P360	B	222	107	10D	4	X330	B	247	62	5E	4
L267	B	280	88	8E	3	P361	B	225	107	10D	4	X331	B	250	62	5E	4
L268	B	291	85	8E	3	P390	B	151	111	11E	4	X405	B	193	73	8E	5
L275	B	281	63	9E	3	P391	B	149	111	11E	4	X406	B	196	73	8E	5
L277	B	281	43	11E	3	P450	B	172	36	7A	5	X407	B	198	73	8E	5
L282	B	278	45	11E	3	P451	B	172	38	7A	5	X460	B	231	78	1B	5
L285	B	298	52	8C	3	P460	B	163	90	11E	5	X461	B	231	81	1B	5
L286	B	290	28	8C	3	P461	B	163	88	12E	5	X462	B	231	83	1B	5
L290	B	290	18	9C	3	P465	B	249	88	4E	5	X540	B	57	134	6C	6
L406	B	203	60	7D	5	P466	B	246	88	4E	5	X541	B	54	134	6C	6
L421	B	181	33	8B	5	P520	B	67	67	3C	6	X542	B	51	134	6C	6
L442	B	215	19	9C	5	P525	B	67	74	4C	6						

Nicht-Service-Relevante Bauteile / Non-Service-Relevant Components

Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg
C1	A	18	118	1D	2	C55	B	188	139	8E	2	C99	B	47	43	10B	2
C3	B	25	116	2E	2	C56	B	176	136	7E	2	C100	A	40	42	9B	2
C4	A	24	100	2E	2	C65	A	184	123	8E	2	C101	A	101	68	4B	2
C7	A	15	118	2D	2	C67	B	188	118	8E	2	C103	B	114	52	3C	2
C8	A	14	106	2D	2	C68	B	185	118	8D	2	C104	B	114	41	2C	2
C10	A	27	107	3E	2	C69	A	21	21	8D	2	C105	B	114	64	2B	2
C15	A	14	101	3C	2	C70	A	59	140	8D	2	C106	B	112	75	2B	2
C20	A	43	115	4D	2	C71	A	12	25	8D	2	C107	B	102	49	2B	2
C21	A	44	121	4D	2	C72	B	176	121	7D	2	C108	B	110	84	2A	2
C22	A	36	124	4D	2	C75	A	20	39	7D	2	C158	B	56	52	11C	2
C23	A	41	119	4D	2	C77	B	17	23	8C	2	C200	A	199	124	2D	3
C30	A	31	81	4E	2	C78	B	16	20	8C	2	C204	A	201	120	2C	3
C32	A	29	86	5D	2	C79	A	18	47	7D	2	C206	A	216	125	3D	3
C33	A	37	79	5E	2	C82	B	17	42	7C	2	C207	A	222	137	2E	3
C38	A	37	89	5D	2	C85	A	18	61	7C	2	C211	B	102	59	5B	2
C42	A	18	94	5E	2	C87	B	23	67	7B	2	C212	B	102	44	5B	2
C51	A	188	129	7F	2	C88	B	25	70	7B	2	C218	A	204	138	3C	3
C52	A	184	137	8F	2	C92	B	17	66	6B	2	C219	A	205	140	3B	3
C54	B	187	137	8E	2	C98	B	17	58	8C	2	C221	A	222	127	3D	3

MENP PFLUGER	Datum Date	XY-Liste fuer XY-list for	Sachnummer Stock-No.	Aei	Blatt Page
ROHDE & SCHWARZ	98-02-11	EE REFERENZ_STEPSYNTHESE REFERENZ_STEPSYNTHESE	1035.6501.01 XY	11.00	1+

Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg
C222	A	225	127	3D	3	C295	A	279	15	11C	3	C413	B	181	42	8B	5
C223	B	226	129	3D	3	C296	A	277	37	10C	3	C414	B	175	38	7B	5
C229	B	236	130	4D	3	C297	A	298	35	11C	3	C417	B	175	34	7B	5
C230	B	241	130	4D	3	C298	B	279	26	10B	3	C418	A	171	43	8C	5
C231	B	244	127	4D	3	C299	B	281	23	10C	3	C420	A	175	46	8C	5
C232	B	240	126	4D	3	C311	A	252	34	3E	4	C421	A	196	31	8A	5
C233	B	259	129	4D	3	C312	A	262	43	2E	4	C423	A	203	34	8B	5
C234	B	255	128	4D	3	C313	A	248	44	2E	4	C424	B	197	47	7C	5
C235	B	256	137	5D	3	C315	B	219	66	5E	4	C431	B	162	42	9E	5
C236	A	264	126	4B	3	C319	B	238	73	6E	4	C432	B	158	47	9E	5
C240	B	286	125	5C	3	C320	B	235	62	6D	4	C434	B	218	20	9C	5
C241	B	296	123	5C	3	C321	B	231	62	6D	4	C435	B	210	31	9C	5
C250	B	273	136	5D	3	C322	B	214	47	2A	4	C436	A	153	63	10E	5
C251	B	274	137	5D	3	C323	A	234	29	5F	4	C437	A	159	68	10F	5
C252	A	276	139	6D	3	C324	B	223	66	5D	4	C439	A	218	29	10D	5
C253	B	290	47	10E	3	C325	B	221	64	5E	4	C440	B	154	56	10E	5
C254	A	298	59	10D	3	C326	B	232	75	6E	4	C441	B	157	67	10E	5
C255	A	279	139	6C	3	C327	B	244	67	2C	4	C443	A	225	16	10D	5
C256	B	263	56	9B	3	C328	A	255	31	3F	4	C445	A	235	19	10C	5
C257	A	286	130	7D	3	C329	A	251	28	3F	4	C447	A	231	17	10C	5
C258	A	296	133	6E	3	C330	A	211	58	4A	4	C448	A	234	14	10C	5
C260	A	299	114	7C	3	C331	A	212	43	1A	4	C449	B	240	13	11C	5
C261	A	299	126	7B	3	C350	B	172	106	7C	4	C450	B	159	80	11E	5
C262	B	286	117	7E	3	C351	B	183	104	8C	4	C453	A	255	15	11C	5
C263	B	294	135	6B	3	C352	B	181	104	8C	4	C454	A	155	79	11F	5
C264	B	288	102	8E	3	C353	B	188	98	8C	4	C455	B	216	87	2C	5
C265	B	286	100	8E	3	C354	B	193	104	9C	4	C457	A	243	77	3E	5
C266	B	281	98	8E	3	C355	A	195	98	9D	4	C458	A	161	84	11E	5
C267	B	279	100	8E	3	C356	A	203	100	9D	4	C459	A	262	95	2D	5
C268	B	283	87	8E	3	C357	B	204	98	9C	4	C460	B	234	80	1E	5
C269	B	283	84	8E	3	C358	B	208	104	10C	4	C461	A	257	14	11C	5
C270	B	297	80	9E	3	C359	B	204	101	9C	4	C462	B	217	81	2C	5
C271	B	281	59	10E	3	C360	B	208	102	9C	4	C463	A	263	82	2E	5
C272	B	289	59	10E	3	C361	A	218	101	10C	4	C464	A	233	77	3E	5
C273	A	296	48	10E	3	C362	A	213	107	11C	4	C465	B	224	99	1D	5
C274	A	292	53	10D	3	C363	A	196	108	11C	4	C467	A	257	19	12C	5
C276	B	283	61	10E	3	C366	B	219	103	10C	4	C468	A	227	103	3D	5
C277	B	275	43	11E	3	C367	B	219	105	10C	4	C469	B	211	81	3C	5
C278	A	277	68	11E	3	C368	B	217	99	10C	4	C470	B	231	87	4A	5
C279	A	283	68	11F	3	C380	B	165	118	9E	4	C471	B	192	108	4A	5
C280	B	277	41	11E	3	C381	A	161	127	10F	4	C472	A	232	74	4E	5
C281	B	290	41	8C	3	C382	A	164	122	10F	4	C473	B	201	84	4D	5
C282	B	274	31	8C	3	C383	B	160	125	9E	4	C474	A	178	83	6C	5
C283	B	263	67	8B	3	C384	A	155	126	9E	4	C475	A	188	86	6B	5
C284	B	296	61	7B	3	C385	B	157	131	10E	4	C476	A	194	90	6B	5
C285	B	298	49	8C	3	C386	B	154	134	10E	4	C477	A	170	83	5C	5
C286	A	298	26	9C	3	C387	B	157	118	10E	4	C478	B	185	89	6B	5
C287	A	296	22	9D	3	C388	B	153	101	11E	4	C479	B	178	88	6B	5
C288	B	287	26	9C	3	C401	B	189	66	8D	5	C480	A	255	105	2A	5
C289	B	290	25	9C	3	C402	B	189	59	7D	5	C481	A	247	95	3D	5
C290	A	283	21	11B	3	C404	B	185	49	7D	5	C482	B	197	91	3C	5
C291	A	274	24	11B	3	C406	B	186	45	7D	5	C483	A	254	74	3A	5
C292	B	278	23	11C	3	C408	B	178	44	8C	5	C484	A	241	98	4B	5
C293	A	288	41	10D	3	C410	A	203	47	7C	5	C485	A	178	90	5D	5
C294	A	288	28	10C	3	C411	B	193	43	8C	5	C486	B	190	80	3C	5

MENP PFLUGER	Datum Date	XY-Liste fuer XY-list for	Sachnummer Stock-No.	Aei	Blatt Page
ROHDE & SCHWARZ	98-02-11	EE REFERENZ_STEPSYNTHESE REFERENZ_STEPSYNTHESE	1035.6501.01 XY	11.00	2+

Part	Side	X	Y	Sqr	Pg
C487	A	241	77	4B	5
C488	A	176	80	6C	5
C489	A	203	69	6A	5
C491	A	228	82	5B	5
C492	A	214	84	5B	5
C500	B	52	59	1A	6
C501	A	38	67	2A	6
C510	B	54	85	2A	6
C511	B	34	38	10E	2
C513	B	29	30	11E	2
C514	A	29	21	11E	2
C515	A	29	41	11D	2
C516	A	29	44	11D	2
C517	B	41	55	11C	2
C519	B	40	57	11C	2
C524	B	58	55	4F	6
C525	B	65	38	4E	6
C526	B	63	32	5E	6
C530	A	56	82	5D	6
C531	A	51	78	6D	6
C532	A	56	71	6D	6
C535	A	76	66	3B	6
C536	A	74	72	4B	6
C537	A	81	75	4B	6
C538	B	52	98	4C	6
C539	B	60	105	4C	6
C540	A	91	116	5A	6
C541	B	53	112	4B	6
C542	B	59	123	5C	6
C543	B	57	130	6C	6
C544	A	85	119	5A	6
C545	A	63	115	5C	6
C546	A	57	121	5C	6
C547	A	102	122	6A	6
C548	A	97	122	6A	6
C552	B	104	110	10D	6
C555	A	100	130	8E	6
C556	A	105	130	5A	6
C557	A	96	124	5A	6
C558	A	86	124	8E	6
C560	B	77	110	10F	6
C561	B	80	110	10E	6
C562	B	90	100	9E	6
C563	B	75	105	12F	6
C564	B	84	109	9E	6
C565	B	97	100	10D	6
C566	A	63	51	8B	6
C567	A	60	20	8C	6
C570	A	42	20	8C	6
C574	A	67	20	10C	6
C575	B	78	22	9D	6
C576	A	65	17	10C	6
C577	A	74	18	11C	6
C578	B	60	15	8B	6
C579	A	72	124	10E	6
C580	B	80	14	8C	6
C582	B	85	137	6F	6
C595	B	78	102	11E	6
C609	A	136	36	4F	7
C610	A	74	50	2A	7
C620	A	100	14	1A	7
C621	B	130	76	6E	7
C650	B	121	114	3A	7
C660	B	118	132	3A	7
C680	B	128	98	4A	7
C685	B	130	110	10D	7
C688	B	123	107	11E	7
C690	A	128	116	6A	7
C691	B	140	117	6A	7
C695	B	134	107	10C	7
C697	B	118	126	11D	7
C698	A	132	99	11C	7
C900	B	62	91	3A	6
C901	A	69	34	4A	6
D95-A	B	44	46	9E	2
D95-B				10C	2
D95-C				10B	2
D320-A	B	220	50	6E	4
D320-B				3A	4
D320-C				2A	4
D330-A	A	232	70	5C	4
D330-B				4A	4
D340-A	A	220	60	5B	4
D340-B				5A	4
D430-A	A	250	93	5A	5
D430-B				5A	5
D430-C				2D	5
D430-D				1D	5
D430-E				2A	5
D445-A	A	250	77	5A	5
D445-B				5A	5
D445-C				2E	5
D445-D				1E	5
D445-E				3A	5
D460-A	A	219	88	6E	5
D460-B				6E	5
D460-C				2B	5
D460-D				2B	5
D460-E				5B	5
D500-A	B	39	63	2E	6
D500-B				1A	6
D505-A	A	45	39	10E	2
D505-B				7A	6
D505-C				8A	6
D505-D				10D	2
D505-E				9B	2
D510-A	B	77	50	2D	6
D510-B				3A	6
D515-A	B	54	74	2B	6
D515-B				3E	6
D515-C				2A	6
D520-A	B	77	39	4E	6
D520-B				3A	6
D525-A	B	69	66	3C	6
D525-B				3C	6
D525-C				4A	6
D535-A	B	55	60	3F	6
D535-B				7C	6
D535-C				7D	6
D535-D				9F	6
D535-E				2A	6
D550-A	B	77	83	3D	6
D550-B				2D	6
D550-C				4B	6
D550-D				3D	6
D550-E				4A	6
D555	A	86	127	8E	6
D600-A	A	91	14	2E	7
D600-B				2E	7
D600-C				2D	7
D600-D				2D	7
D600-E				1A	7
D620-A	A	118	100	3C	7
D620-B				5A	7
D630-A	B	69	62	5C	7
D630-B				2A	7
D640-A	A	117	117	8E	7
D640-B				8D	7
D640-C				7B	7
D640-D				11D	7
D640-E				11C	7
D640-F				11E	7
D640-G				4A	7
D650-A	A	118	131	8E	7
D650-B				3A	7
D660-A	A	139	140	8D	7
D660-B				3A	7
D680-A	A	133	102	10E	7
D680-B				11E	7
D680-C				10C	7
D680-D				11C	7
D680-E				4A	7
L1	B	21	100	2E	2
L2	B	51	93	2F	2
L3	B	41	80	2E	2
L15	B	22	113	3D	2
L30	B	43	97	4D	2
L33	B	38	83	5E	2
L50	B	181	132	6F	2
L55	B	181	135	7F	2
L65	B	181	120	7E	2
L73	B	22	47	7D	2
L75	B	20	42	7D	2
L85	B	13	64	7C	2
L96	B	57	40	10F	2

MENP / PFLUGER	Datum / Date	XY-Liste fuer / XY-list for	Sachnummer / Stock-No.	Aei	Blatt / Page
ROHDE & SCHWARZ	98-02-11	EE REFERENZ_STEPSYNTHESE / REFERENZ_STEPSYNTHESE	1035.6501.01 XY	11.00	3+

Part	Side	X	Y	Sqr	Pg
L97	B	48	37	10E	2
L98	B	15	58	9C	2
L100	B	147	16	2C	2
L101	B	125	16	2B	2
L102	B	126	20	2B	2
L103	B	90	7	2B	2
L104	B	114	20	2A	2
L107	B	118	46	3B	2
L108	B	116	79	3B	2
L109	B	90	38	3B	2
L110	B	113	84	3A	2
L209	B	209	119	2B	3
L210	B	95	55	5B	2
L211	B	199	108	3A	3
L215	B	208	138	3C	3
L216	B	198	140	3C	3
L253	B	275	128	6E	3
L256	B	299	133	7E	3
L260	B	299	110	7C	3
L261	B	296	132	6B	3
L262	B	290	117	7E	3
L271-A	B	295	69	9E	3
L271-B				9E	3
L278	B	274	69	11E	3
L280	A	278	55	9C	3
L281	B	263	63	9B	3
L288	B	298	22	9C	3
L291	A	284	44	9D	3
L292	A	284	27	10C	3
L320	A	228	30	5F	4
L322	A	212	46	1A	4
L324	B	225	30	2C	4
L325	B	225	73	6E	4
L326	B	223	69	6E	4
L330	A	211	68	4A	4
L350	B	175	104	8C	4
L351	B	192	101	8C	4
L352	B	172	108	7C	4
L353	B	186	108	8C	4
L359	B	202	105	9C	4
L360	B	210	107	9C	4
L361	B	215	105	10C	4
L380	B	164	125	10E	4
L381	B	140	127	7F	4
L382	B	148	114	8F	4
L383	B	128	112	7E	4
L384	B	151	109	8E	4
L387	B	153	131	10E	4
L388	B	154	115	10E	4
L390	B	137	104	7E	4
L391	B	148	102	8E	4
L392	B	126	84	7E	4
L393	B	152	86	8E	4
L394	B	139	81	7E	4
L395	B	150	73	8E	4
L402	B	198	70	8E	5
L405	B	188	68	7E	5
L408	B	178	52	8D	5
L410	B	192	51	7D	5
L415	B	171	41	8D	5
L418	B	189	36	8B	5
L420	B	194	31	8A	5
L435	B	158	62	10E	5
L436	B	210	34	9C	5
L437	B	237	17	10C	5
L438	B	227	14	11C	5
L439	B	237	11	11C	5
L448	B	156	80	11E	5
L450	A	253	67	3A	5
L463	B	247	75	2E	5
L464	B	243	83	3E	5
L466	A	184	90	6B	5
L467	B	244	102	3D	5
L468	B	247	91	3D	5
L470	B	220	77	2C	5
L475	B	170	90	5C	5
L476	B	173	80	6C	5
L480	A	262	105	2A	5
L500	B	51	65	1A	6
L510	B	61	85	2A	6
L511	B	31	46	10E	2
L513	B	31	30	11E	2
L519	A	39	58	11C	2
L525	B	63	48	4F	6
L526	B	60	42	5F	6
L550	B	69	87	3A	6
L551	B	151	31	8D	7
L552	B	161	16	7D	6
L553	B	161	31	7D	6
L558	B	156	19	11D	6
L565	B	72	102	11F	6
L575	A	75	23	10D	6
L576	B	156	35	10D	6
L580	A	81	19	9C	6
L620	A	92	11	1B	7
L621	B	126	82	6F	7
L630	A	70	53	2B	7
L650	B	121	120	2B	7
N290	A	290	34	10D	3
N350	B	195	101	9C	4
N430	B	158	50	9E	5
N440	B	158	71	11E	5
N460-A	A	237	91	3E	5
N460-B				4E	5
N460-C				4B	5
N465-A	B	189	83	3C	5
N465-B				6B	5
N468-A	B	243	87	5E	5
N468-B				5E	5
N468-C				2A	5
N468-D				2A	5
N468-E				4A	5
N470	B	219	87	1C	5
N530	A	54	115	5C	6
N550-A	B	95	122	10D	6
N550-B				6A	6
N562-A	B	85	119	9E	6
N562-B				5A	6
N565-A	B	90	130	8E	6
N565-B				5A	6
N585	B	88	138	6E	6
N680-A	A	133	116	10E	7
N680-B				10E	7
N680-C				10C	7
N680-D				10C	7
N680-E				6A	7
P325	B	236	70	6E	4
P326	B	239	70	6E	4
R1	A	21	118	2D	2
R2	B	30	110	2D	2
R4	A	37	100	2E	2
R6	A	28	104	2D	2
R7	A	14	109	2D	2
R8	A	17	124	2C	2
R10	A	32	109	2E	2
R11	A	25	114	2E	2
R15	A	18	104	3D	2
R16	A	17	101	3C	2
R17	A	29	113	3D	2
R21	A	35	116	4D	2
R22	A	43	124	4D	2
R30	A	32	98	4E	2
R31	A	40	96	4D	2
R35	A	26	86	5E	2
R36	A	25	96	5D	2
R38	A	40	89	5D	2
R40	A	35	84	5D	2
R42	A	23	84	5D	2
R47	A	20	84	5D	2
R48	A	15	90	6C	2
R49	A	20	77	6C	2
R50	A	188	132	7F	2
R53	A	184	135	7F	2
R56	B	174	130	6E	2
R57	B	174	132	6E	2
R58	B	175	134	6E	2
R59	B	178	137	7E	2
R65	A	188	126	7E	2
R67	A	184	120	7E	2
R68	A	15	25	8D	2
R69	A	51	140	8D	2
R71	B	173	119	6D	2
R72	B	176	119	6D	2
R73	B	178	123	7D	2
R75	A	13	44	7D	2

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ROHDE & SCHWARZ	98-02-11	EE REFERENZ_STEPSYNTHESE REFERENZ_STEPSYNTHESE	1035.6501.01 XY	11.00	4+

Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg
R77	A	18	41	7D	2	R272	B	287	57	10E	3	R337	A	175	108	4D	5
R80	B	13	45	6C	2	R273	B	292	48	10E	3	R338	A	231	105	5D	5
R81	B	15	45	6C	2	R274	A	296	50	10D	3	R339	A	150	138	4D	5
R82	B	15	42	6C	2	R275	A	295	56	10D	3	R341	A	260	45	3D	4
R83	B	21	25	7C	2	R276	B	280	57	10E	3	R342	A	236	34	3D	4
R85	A	15	58	7C	2	R277	A	280	65	11F	3	R343	A	258	49	3D	4
R87	A	17	67	7B	2	R278	B	278	54	11E	3	R350	B	172	98	7C	4
R89	B	34	44	9C	2	R279	B	279	33	8C	3	R351	A	190	100	9D	4
R91	B	15	56	6B	2	R280	B	291	35	8C	3	R352	A	201	98	9D	4
R92	B	21	62	6B	2	R281	B	274	21	11C	3	R355	A	203	103	9D	4
R93	B	17	70	6B	2	R282	B	271	44	11E	3	R357	B	210	98	9C	4
R94	A	43	47	9C	2	R283	A	296	25	9D	3	R360	A	221	105	10D	4
R96	B	27	70	8B	2	R284	A	294	20	9D	3	R362	A	210	101	11C	4
R97	B	29	67	8B	2	R285	B	274	26	10B	3	R363	A	207	107	11C	4
R98	B	30	57	8B	2	R286	B	284	40	8C	3	R380	A	159	123	9F	4
R99	A	36	43	9E	2	R287	B	277	16	11C	3	R381	A	160	130	10F	4
R100	A	93	52	4B	2	R288	A	295	37	9C	3	R382	B	156	128	9E	4
R101	A	90	66	4B	2	R289	A	292	33	10C	3	R383	B	155	125	9E	4
R105	A	112	37	3C	2	R290	A	280	22	11B	3	R384	B	160	123	9E	4
R200	A	199	130	2D	3	R291	A	276	24	11B	3	R385	B	162	128	10E	4
R201	A	207	116	2D	3	R292	A	277	34	9D	3	R388	A	154	107	11E	4
R202	A	203	130	2C	3	R293	A	280	37	10C	3	R400	B	214	91	2C	5
R204	A	204	120	2D	3	R294	B	285	32	9C	3	R401	B	180	50	8D	5
R206	A	210	122	2D	3	R295	A	292	39	10C	3	R405	B	177	47	8D	5
R207	A	220	137	2D	3	R296	B	279	28	10B	3	R406	B	203	47	7C	5
R208	A	211	128	3D	3	R297	A	280	31	10D	3	R407	A	200	44	7C	5
R209	A	211	131	2D	3	R298	B	284	24	10C	3	R411	B	194	38	8C	5
R210	B	221	131	3E	3	R299	B	284	18	11C	3	R412	B	191	41	8C	5
R212	B	208	124	2C	3	R309	A	263	45	2E	4	R415	B	181	30	8A	5
R213	B	210	124	3C	3	R310	A	255	37	2E	4	R416	B	177	30	7A	5
R217	A	202	134	2C	3	R311	A	255	39	3E	4	R417	B	196	35	8B	5
R223	B	226	134	3D	3	R312	A	252	47	3D	4	R418	B	191	30	9B	5
R240	B	281	128	5D	3	R313	A	244	34	4E	4	R419	B	189	33	8B	5
R241	B	289	125	5C	3	R314	A	248	37	5E	4	R422	B	253	85	5F	5
R249	B	264	46	12E	3	R315	B	222	56	5E	4	R424	B	237	104	5D	5
R250	B	273	140	5D	3	R316	A	252	50	3D	4	R425	A	212	98	6F	5
R251	A	278	130	6D	3	R317	A	238	37	4D	4	R426	A	211	90	6E	5
R252	B	264	49	11E	3	R318	A	229	39	4D	4	R427	B	230	100	6E	5
R253	B	263	46	12E	3	R319	A	234	31	5F	4	R428	B	235	19	10C	5
R255	A	281	133	6D	3	R320	A	243	46	5E	4	R429	B	211	16	9C	5
R256	A	281	135	6C	3	R321	A	240	46	4E	4	R430	B	158	44	9E	5
R257	A	286	128	6D	3	R322	B	226	66	6D	4	R431	B	161	48	9D	5
R258	A	293	130	6D	3	R323	B	232	66	6D	4	R432	B	214	85	2C	5
R259	A	289	133	6D	3	R324	B	233	70	6E	4	R433	B	151	50	9D	5
R260	A	289	128	7D	3	R325	B	235	75	6E	4	R434	B	218	26	9C	5
R261	A	281	114	7C	3	R326	A	252	42	2E	4	R435	B	214	15	10C	5
R262	B	295	113	7D	3	R327	A	252	44	2E	4	R436	A	156	58	10E	5
R263	B	286	111	7E	3	R328	A	252	52	4C	4	R437	A	159	63	10F	5
R264	A	281	117	7C	3	R329	A	223	46	5F	4	R438	A	221	19	10D	5
R265	A	285	139	6C	3	R330	B	211	53	2A	4	R439	A	227	19	10D	5
R266	A	276	112	6C	3	R331	B	214	63	2A	4	R440	B	151	58	10E	5
R267	A	289	112	6C	3	R333	A	241	62	5E	4	R442	A	247	78	4A	5
R269	A	285	65	10F	3	R334	A	238	105	5E	5	R443	A	218	19	10C	5
R270	B	286	63	9E	3	R335	A	219	66	5D	4	R444	A	252	91	5A	5
R271	A	276	15	11C	3	R336	A	216	67	5C	4	R445	A	257	11	11C	5

MENP PFLUGER	Datum Date	XY-Liste fuer XY-list for	Sachnummer Stock-No.	Aei	Blatt Page
ROHDE & SCHWARZ	98-02-11	EE REFERENZ_STEPSYNTHESE REFERENZ_STEPSYNTHESE	1035.6501.01 XY	11.00	5+

Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg	Part	Side	X	Y	Sqr	Pg
R446	B	224	16	10C	5	R502	A	49	70	2E	6	R565	A	88	100	9D	6
R447	B	228	19	10C	5	R503	A	41	61	2E	6	R566	A	93	100	9D	6
R448	A	261	17	11C	5	R504	A	44	59	2E	6	R567	B	53	69	9F	6
R449	B	224	91	5E	5	R505	A	46	59	2E	6	R568	A	90	122	9E	6
R450	B	224	93	5F	5	R506	A	39	70	2E	6	R569	A	80	124	9E	6
R451	A	159	88	11E	5	R507	B	40	35	10D	2	R570	A	57	56	7B	6
R452	A	155	84	11F	5	R509	B	35	32	7B	6	R571	A	72	121	10E	6
R453	A	231	93	4E	5	R510	A	62	81	3E	6	R573	B	72	98	11F	6
R454	B	158	85	11E	5	R511	B	43	35	10E	2	R574	B	82	100	11E	6
R455	B	161	88	11E	5	R512	B	53	71	1C	6	R575	B	65	21	8C	6
R456	A	233	89	4E	5	R513	B	31	34	11E	2	R576	B	97	97	10D	6
R457	B	161	90	11E	5	R514	A	29	31	11D	2	R577	B	49	18	8C	6
R458	B	156	90	11E	5	R515	A	31	39	11D	2	R578	B	75	23	9C	6
R459	A	215	92	6D	5	R516	B	43	56	11C	2	R579	B	77	22	9D	6
R460	B	240	80	1E	5	R517	A	45	55	11C	2	R580	A	65	24	10C	6
R461	A	259	75	1E	5	R518	B	56	49	11C	2	R581	A	67	18	10C	6
R462	A	259	85	2E	5	R519	B	40	60	11C	2	R582	B	66	16	8B	6
R463	B	262	85	2E	5	R520	A	77	43	2D	6	R583	B	75	18	9C	6
R464	A	232	86	3E	5	R521	A	69	43	2C	6	R584	B	102	133	6E	6
R465	B	228	104	1D	5	R522	A	73	46	2C	6	R587	B	91	141	6E	6
R466	A	258	96	1E	5	R523	A	71	39	4E	6	R589	A	85	95	12F	6
R467	A	262	102	2D	5	R524	B	60	50	4F	6	R590	B	86	134	6F	6
R468	B	260	93	2D	5	R525	A	81	78	2D	6	R591	B	80	97	10E	6
R470	A	234	99	3D	5	R526	A	72	84	2D	6	R592	B	66	24	9C	6
R471	A	238	84	3E	5	R527	A	69	36	4D	6	R593	B	63	13	8B	6
R472	B	200	87	4D	5	R528	A	73	62	3D	6	R597	B	84	98	11E	6
R473	B	214	75	2C	5	R529	A	70	62	3D	6	R598	B	75	96	10F	6
R474	B	197	87	4C	5	R530	A	53	82	5D	6	R599	B	78	104	11E	6
R475	B	216	83	2C	5	R531	A	53	75	6D	6	R600	B	141	23	3F	7
R476	B	203	81	3C	5	R533	A	34	43	8B	6	R601	B	125	23	3E	7
R477	A	173	86	5D	5	R535	A	78	66	3B	6	R602	B	136	23	3E	7
R478	B	233	85	4A	5	R536	A	77	72	4B	6	R603	B	131	23	3D	7
R479	A	215	87	6D	5	R540	B	67	78	4C	6	R604	B	117	24	3D	7
R480	B	252	91	5F	5	R541	A	56	96	4C	6	R605	B	95	14	2E	7
R481	B	250	93	5E	5	R542	A	65	85	4C	6	R607	B	99	16	2D	7
R482	B	234	99	5E	5	R543	A	59	97	4C	6	R608	B	94	19	3D	7
R483	B	240	98	5E	5	R544	A	60	112	4C	6	R610	B	136	38	3F	7
R484	A	241	100	4B	5	R545	A	51	116	5C	6	R611	A	124	37	3E	7
R485	A	175	86	5D	5	R546	A	63	131	5D	6	R612	A	135	43	3E	7
R486	A	238	77	4A	5	R547	A	58	108	4B	6	R613	A	132	45	3D	7
R487	A	225	82	5B	5	R548	A	63	121	5D	6	R614	A	121	45	3D	7
R488	A	217	81	5B	5	R550	A	60	128	5C	6	R615	B	120	24	3E	7
R489	A	231	99	1A	5	R551	B	99	126	9D	6	R616	A	122	36	3E	7
R490	B	191	81	3D	5	R552	B	97	116	10D	6	R619	A	124	58	4D	7
R491	B	197	81	3D	5	R553	B	104	105	10D	6	R620	B	124	100	3C	7
R492	A	228	93	1A	5	R554	B	71	109	10F	6	R629	A	81	55	5C	7
R493	B	173	82	4C	5	R555	A	83	132	7E	6	R630	A	135	50	4E	7
R494	A	198	81	6A	5	R556	A	102	134	7E	6	R631	A	141	55	4E	7
R495	A	186	80	6A	5	R558	A	88	140	7E	6	R632	A	130	56	4E	7
R496	A	156	65	9F	5	R559	A	98	139	7D	6	R633	A	141	57	4E	7
R497	A	153	81	11F	5	R560	A	63	64	7E	6	R634	A	141	65	4E	7
R498	A	228	100	1B	5	R561	A	95	122	9E	6	R635	A	141	67	4E	7
R499	A	224	105	1B	5	R562	A	89	113	9E	6	R636	A	141	70	4E	7
R500	A	39	61	2E	6	R563	A	81	121	9E	6	R638	A	133	67	5E	7
R501	A	49	60	2E	6	R564	A	63	53	8C	6	R639	A	130	69	5E	7

MENP PFLUGER	Datum Date	XY-Liste fuer XY-list for	Sachnummer Stock-No.	Aei	Blatt Page
ROHDE & SCHWARZ	98-02-11	EE REFERENZ_STEPSYNTHESE REFERENZ_STEPSYNTHESE	1035.6501.01 XY	11.00	6+

Part	Side	X	Y	Sqr	Pg
R640	A	132	62	5E	7
R641	A	127	69	5E	7
R642	A	128	64	5D	7
R643	A	127	59	5D	7
R644	A	124	69	5D	7
R645	A	125	62	5D	7
R649	B	118	120	7B	7
R650	B	128	134	9E	7
R652	B	151	16	8B	7
R653	B	124	88	8D	7
R659	B	124	131	3A	7
R660	B	132	136	9D	7
R661	B	138	134	9C	7
R662	B	134	136	9C	7
R680	B	130	116	10E	7
R681	B	130	119	10E	7
R682	B	125	120	10D	7
R685	B	127	114	10E	7
R687	B	129	102	10E	7
R688	B	127	104	11E	7
R690	A	130	119	6B	7
R691	B	136	122	10C	7
R692	B	136	119	10C	7
R693	B	136	126	10D	7
R694	B	130	106	10D	7
R697	B	127	125	11D	7
R698	A	138	98	11C	7
V5	A	17	115	2D	2
V10	A	35	105	2D	2
V14	B	22	103	3D	2
V35	A	29	93	4D	2
V60	B	183	137	7E	2
V69	A	17	21	8D	2
V70	B	183	123	7D	2
V80	B	19	29	7C	2
V90	B	21	67	7B	2
V95	B	28	63	8B	2
V105	B	118	42	3C	2
V205	A	213	116	2D	3
V206	A	214	129	3D	3
V240	B	280	133	5D	3
V255	A	279	127	6D	3
V260	A	292	127	6D	3
V262	B	292	119	7E	3
V263	B	276	114	7E	3
V265	A	285	114	6C	3
V279	B	284	37	8C	3
V280	B	288	50	11E	3
V285	B	298	42	8C	3
V290	B	282	27	10C	3
V295	B	282	17	11C	3
V299	A	284	17	11B	3
V320	A	244	41	5E	4
V321	A	240	41	4E	4
V322	A	238	44	4E	4
V323	A	247	49	5E	4
V325	B	229	64	5D	4
V361	A	213	102	11C	4
V380	B	160	129	9E	4
V383	B	150	118	9E	4
V400	B	183	64	8E	5
V401	B	185	67	8E	5
V402	B	174	66	8E	5
V403	B	179	64	7E	5
V404	B	172	71	7F	5
V405	B	180	68	7E	5
V406	B	182	68	7E	5
V407	B	176	71	7E	5
V408	B	180	44	7D	5
V418	B	196	37	8C	5
V420	B	194	48	7C	5
V422	B	255	88	5F	5
V424	B	234	108	5D	5
V425	B	227	97	6E	5
V426	B	230	95	6E	5
V435	B	222	17	10C	5
V437	A	252	13	11C	5
V460	A	196	80	6A	5
V466	A	262	87	2E	5
V473	B	172	90	5C	5
V475	A	173	90	5C	5
V514	A	31	25	11E	2
V518	B	47	55	11C	2
V530	A	52	88	5D	6
V531	A	58	74	6D	6
V535	A	81	62	3B	6
V536	A	81	70	3B	6
V540	A	63	137	6C	6
V555	A	101	105	10D	6
V566	A	56	20	8C	6
V570	A	74	117	10E	6
V571	A	77	116	10E	6
V575	B	68	18	9C	6
V582	B	71	24	9C	6
V583	B	63	24	9C	6
V584	B	62	17	9C	6
V585	B	77	99	11E	6
V586	B	84	104	11E	6
V587	A	71	22	10C	6
V590	B	65	12	8B	6
V660	B	121	133	4A	7
V697	B	122	123	11D	7
V698	B	132	102	11C	7
W1A	B	171	142	6D	2
W1B	B	171	142	6D	2
Z1	B	44	81	2E	2
Z95	B	49	33	10E	2
Z100	B	110	27	2C	2
Z101	B	95	27	2B	2
Z102	B	105	27	2B	2
Z103	B	90	27	2B	2
Z104	B	100	27	2A	2
Z210	B	202	108	2B	3
Z280	B	265	56	9B	3
Z382	B	140	119	7F	4
Z384	B	140	109	7E	4
Z390	B	140	99	7E	4
Z391	B	143	86	7E	4
Z392	B	143	76	7E	4
Z550	B	161	22	7D	6
Z560	B	156	29	11D	6
Z600	B	141	27	3F	7
Z601	B	126	27	3E	7
Z602	B	136	27	3E	7
Z603	B	131	27	3D	7
Z604	B	116	27	3D	7
Z605	B	121	27	3E	7
Z650	B	151	22	8B	7

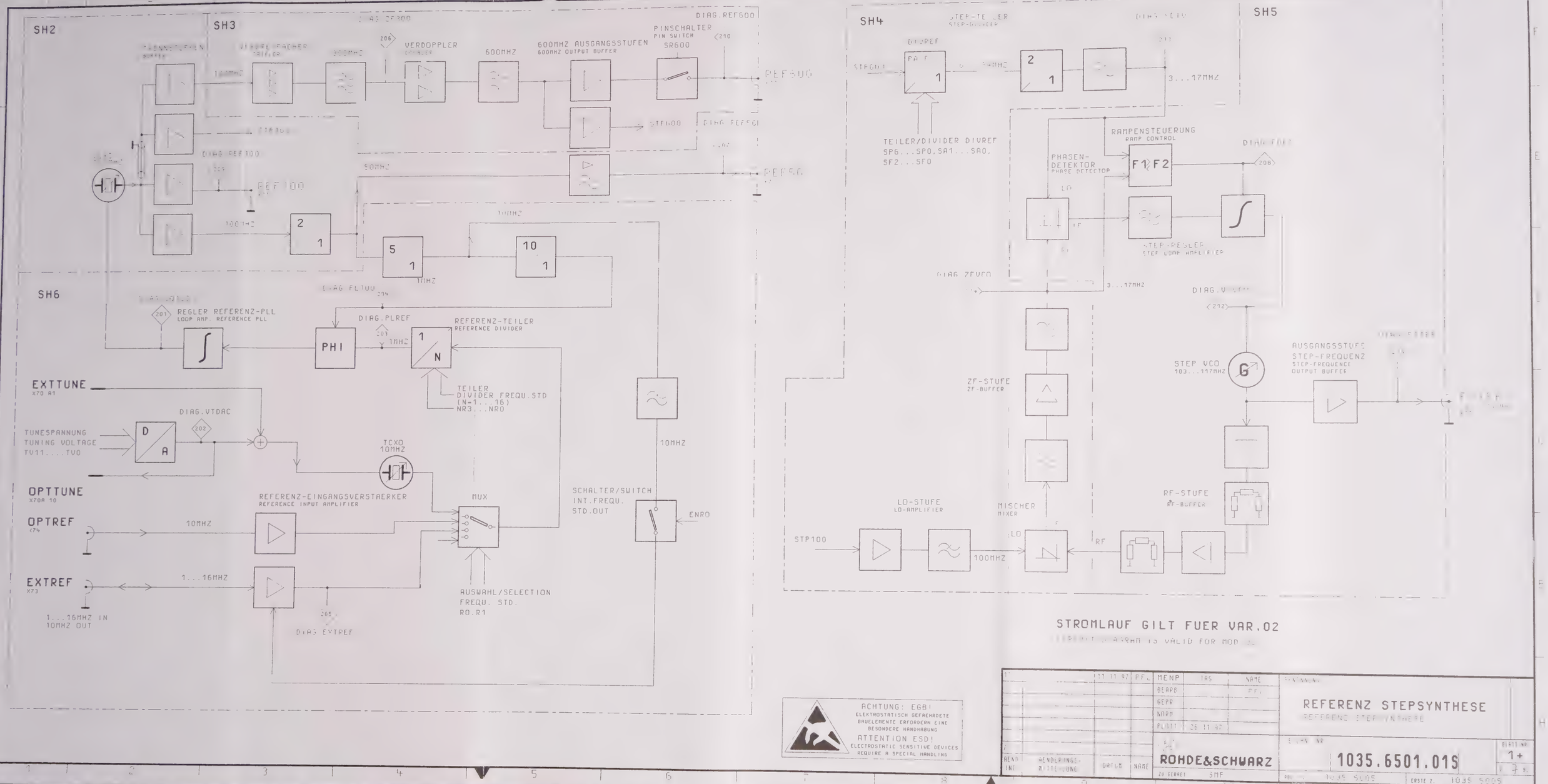
MENP PFLUGER	Datum Date	XY-Liste fuer XY-list for	Sachnummer Stock-No.	Aei	Blatt Page
ROHDE & SCHWARZ	98-02-11	EE REFERENZ_STEPSYNTHESE REFERENZ_STEPSYNTHESE	1035.6501.01 XY	11.00	7-

ROHDE&SCHWARZ

Stromläufe
Bestückungspläne

Circuit diagrams
Component plans

Schémas de circuit
Plans des composants

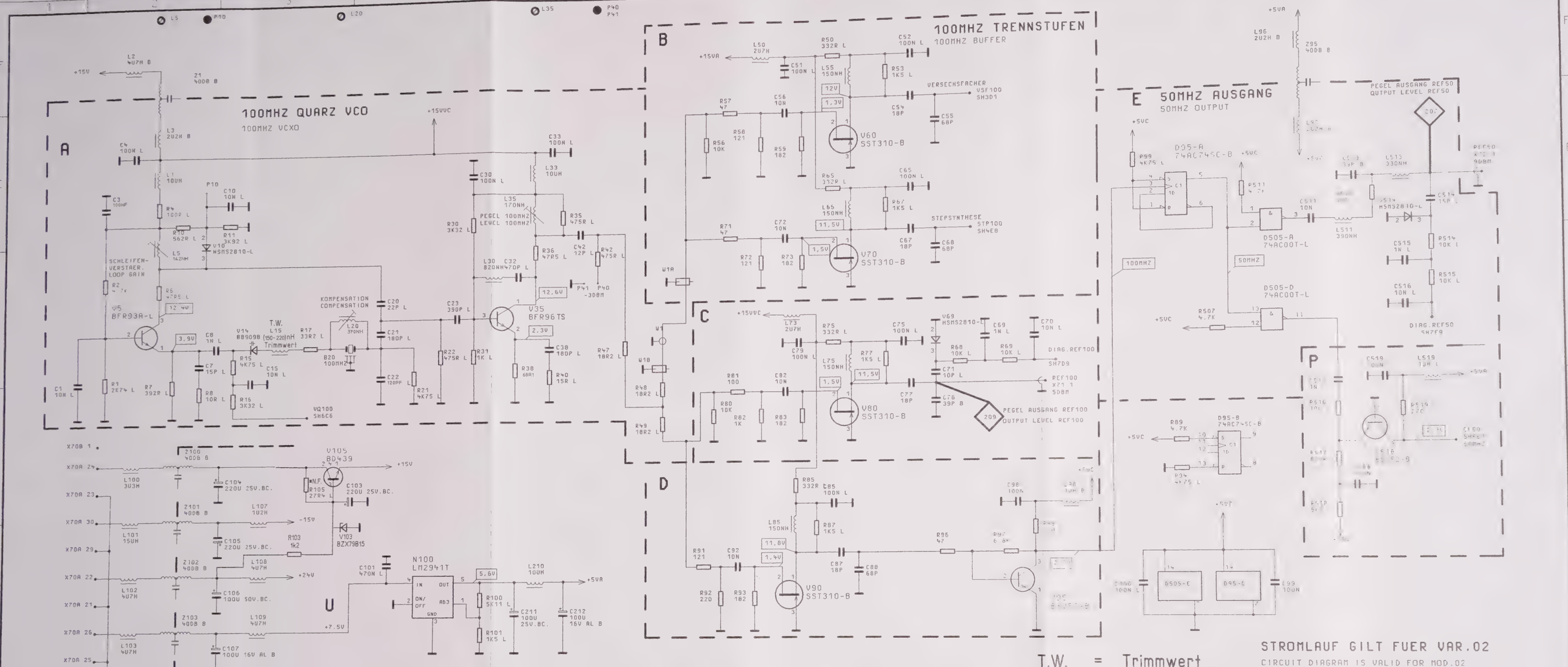


STROMLAUF GILT FUER VAR.02

ACHTUNG: EGB!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG
ATTENTION ESD!
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING

		11.11.97	PFL	MENP	TAG	NAME	BENENNUNG
				BEARB		PFL	REFERENZ STEPSYNTHESE
				GEPR			REFERENZ STEPSYNTHESE
				NORM			
				PLOTT	26.11.97		
AEND. IND.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ			ZEICHN. NR 1035.6501.01S
				ZU GERAET	SMF		BLATT NR 1+
							REV. 1035 5005 ERSTE Z. 1035 5005

FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR



T.W. = Trimmwert

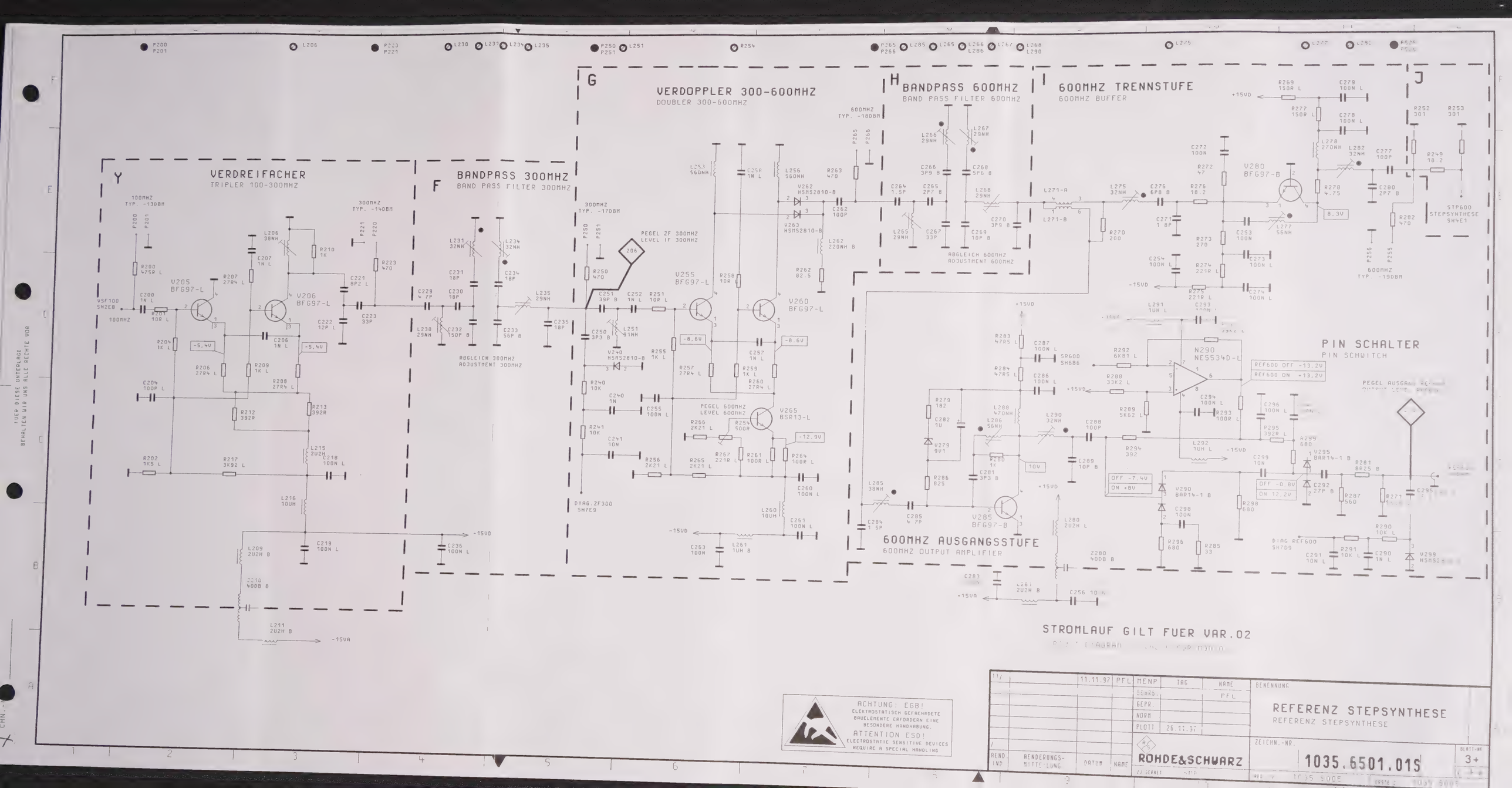
STROMLAUF GILT FUER VAR.02

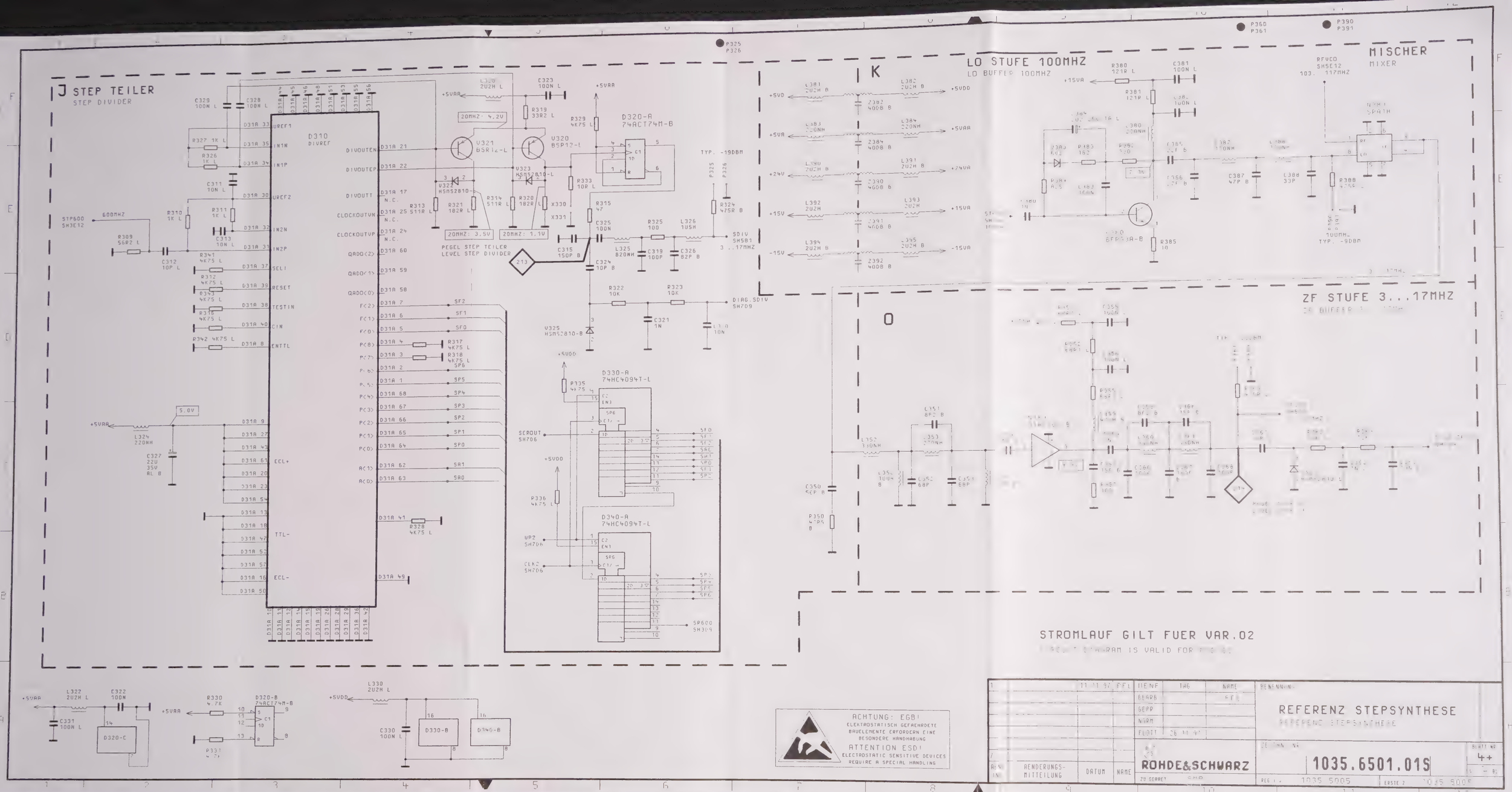
CIRCUIT DIAGRAM IS VALID FOR MOD.02

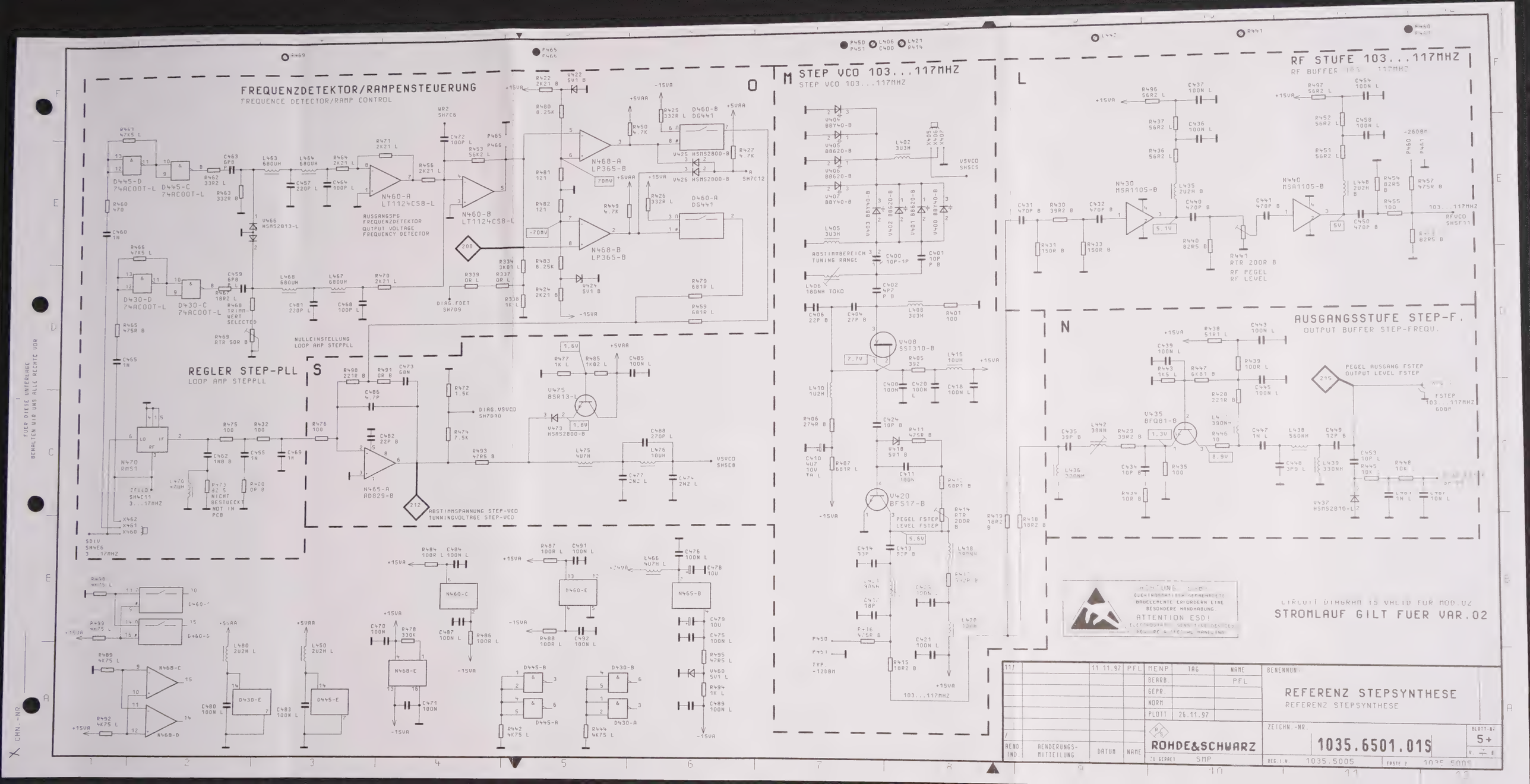
*N.F.= nicht bestückt/not in PCB

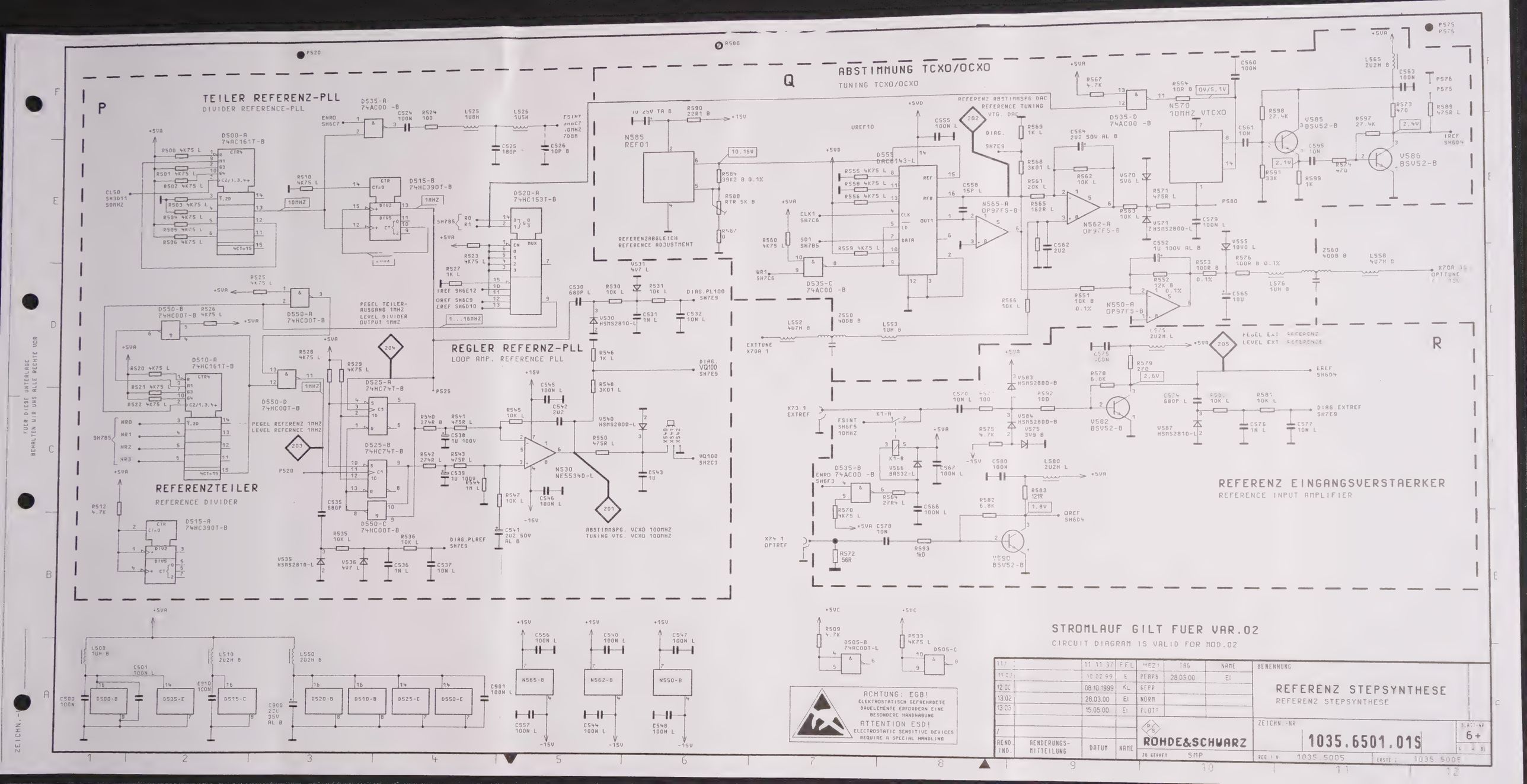
ACHTUNG: EGB!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG.
ATTENTION ESD!
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING

11/		11.11.97	PFL	MEZ1	TAG	NAME	BENENNUNG
11.01		25.08.98	SL	BEARB.	06.08.99	EI	REFERENZ STEPSYNTHESE
11.05		06.08.99	EI	GEPR.			REFERENZ STEPSYNTHESE
12.00		11.10.1999	KL	NORM			
13.00		29.11.99	EI	PLOTT			
13.01		20.03.00	EI				ZEICHN.-NR. 1035.6501.01S
/							BLATT-NR 2+
AEND. IND	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ			V. 7 BL
				ZU GERAET SMP			REG.I.V. 1035 [illegible] ERSTE Z 1035 5005


Y
VERDREIFACHER
TRIPLER 100-300MHZ
F
BANDPASS 300MHZ
BAND PASS FILTER 300MHZ
G
VERDOPPLER 300-600MHZ
DOUBLER 300-600MHZ
H
BANDPASS 600MHZ
BAND PASS FILTER 600MHZ
I
600MHZ TRENNSTUFE
600MHZ BUFFER
J
PIN SCHALTER
PIN SWITCH
600MHZ AUSGANGSSTUFE
600MHZ OUTPUT AMPLIFIER
STROMLAUF GILT FUER VAR.02
ACHTUNG: EGB!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG.
ATTENTION ESD!
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING
ROHDE&SCHWARZ
REFERENZ STEPSYNTHESE
REFERENZ STEPSYNTHESE
1035.6501.01S
11.11.97
PFL
3+


J STEP TEILER
STEP DIVIDER
D310
DIVREF
D320-A
74ACT74M-B
D330-A
74HC4094T-L
D340-A
74HC4094T-L
PEGEL STEP TEILER
LEVEL STEP DIVIDER
K
LO STUFE 100MHZ
LO BUFFER 100MHZ
MISCHER
MIXER
O
ZF STUFE 3...17MHZ
STROMLAUF GILT FUER VAR.02
ACHTUNG: EGB!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG
ATTENTION ESD!
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING
REFERENZ STEPSYNTHESE
ROHDE&SCHWARZ
1035.6501.01S
4+
1035 5005
FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR


FREQUENZDETEKTOR/RAMPENSTEUERUNG
FREQUENCE DETECTOR/RAMP CONTROL
REGLER STEP-PLL
LOOP AMP STEPPLL
STEP VCO 103...117MHZ
STEP VCO 103...117MHZ
RF STUFE 103...117MHZ
RF BUFFER 103...117MHZ
AUSGANGSSTUFE STEP-F.
OUTPUT BUFFER STEP-FREQU.
AUSGANGSPG FREQUENZDETEKTOR
OUTPUT VOLTAGE FREQUENCY DETECTOR
NULLEINSTELLUNG
LOOP AMP STEPPLL
ABSTIMMSPANNUNG STEP-VCO
TUNNINGVOLTAGE STEP-VCO
ABSTIMMBEREICH
TUNING RANGE
PEGEL FSTEP
LEVEL FSTEP
PEGEL AUSGANG FSTEP
OUTPUT LEVEL FSTEP
RF PEGEL
RF LEVEL
ATTENTION ESD!
STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02
11/ 11.11.97 PFL
MENP TAG NAME
BEARB. PFL
GEPR.
NORM
PLOTT 26.11.97
BENENNUNG
REFERENZ STEPSYNTHESE
REFERENZ STEPSYNTHESE
ZEICHN.-NR.
1035.6501.01S
BLATT-NR. 5+
REND. IND. RENDERUNGS-MITTEILUNG DATUM NAME
ROHDE&SCHWARZ
ZU GERAET SMP
REG.I.V. 1035.5005
ERSTE Z 1035.5005
FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR
CHN.-NR



TEILER REFERENZ-PLL
DIVIDER REFERENCE-PLL
ABSTIMMUNG TCXO/OCXO
TUNING TCXO/OCXO
REGLER REFERNZ-PLL
LOOP AMP. REFERENCE PLL
REFERENZTEILER
REFERENCE DIVIDER
REFERENZ EINGANGSVERSTAERKER
REFERENCE INPUT AMPLIFIER
REFERENZABGLEICH
REFERENCE ADJUSTMENT
REFERENZ ABSTIMMSPG DAC
REFERENCE TUNING
VTG. DAC
PEGEL TEILER-AUSGANG 1MHZ
LEVEL DIVIDER OUTPUT 1MHZ
PEGEL REFERENZ 1MHZ
LEVEL REFERNCE 1MHZ
ABSTIMMSPG. VCXO 100MHZ
TUNING VTG. VCXO 100MHZ
PEGEL EXT REFERENZ
LEVEL EXT REFERENCE
FUER DIESE UNTERLAGE BEHALTEN WIR UNS ALLE RECHTE VOR
ZEICHN.-
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BLATT-NR
6+
ROHDE&SCHWARZ
ZU GERAET SMP
REG.I.V. 1035.5005
ERSTE 1035.5005

FUER DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

DATENUEBERTRAGUNG
DATA TRANSFER

R630-R633, R635, R636
NICHT BESTUECKT/NOT IN PCB

D610 SERBUS

RESET-P (X70A 18) — R600 47 — R610 470 — C609 10N L — Z600 100B B
SERBUS-CLK (X70A 12) — D600-A 74HC125T-L — R601 47 — R611 100R L — Z601 100B B — R625 4.7K
SERBUS-SYNC (X70A 16) — R615 470 — R616 475R L — Z605 400B B
SERBUS-D-IN (X70A 15) — D600-B 74HC125T-L — R602 47 — R612 475R L — Z602 100B B
SERBUS -D-OUT (X70A 14, 11, 13) — D600-C 74HC125T-L — R603 100 — R613 475R L — Z603 100B B
D600-D 74HC125T-L — R607 10K (+5V) — R608 4.7K — R604 470 — R614 475R L — Z604 100B B
SERBUS-INT (X70A 17)

+5VD — L621 10UH — C621 22U 35V AL B

R630 4K75 L
R631 4K75 L
R632 4K75 L
R633 4K75 L
R634 4K75 L
R635 4K75 L
R636 4K75 L

D610 SERBUS: TRISTATE, NANDTREE, RESET-P, A1, A2, A3, A4, A5, A6, A7, VDD, VSS, SYNC, SERCLK, DATAEN, DATAIN, DATAOUT, INTEN, INT, IRQOUT, MASK, IRQ, IR1, IR2, IR3, PARDAT0–PARDAT7, SEROUT, CLK1, RD1, WR1, SERIN1, CLK2, RD2, WR2, SERIN2

R638 4K75 L — PARDAT0 — * N.F.
R639 4K75 L — PARDAT1 — * N.F.
R640 4K75 L — PARDAT2
R641 4K75 L — PARDAT3
R642 4K75 L — PARDAT4
R643 4K75 L — PARDAT5 — * N.F.
R644 4K75 L — PARDAT6 — * N.F.
R645 4K75 L — PARDAT7 — * N.F.

+5VD — R619 10K L — IR1 SH7C12 — IRQ SH7E12

SEROUT SH4C5
CLK2, WR2 SH4B5
CLK1, WR1 SH6E7

U

+5VD — R620 4.7K — D620-A 74HC4094T-L (C2, EN3, SRG, C1/→) — DA0, DA1, DA2, END0, END1 SH7E8, SH7D8

P

+5VA — R629 4K75 L — D630-A 74HC4094T-B (C2, EN3, SRG, C1/→) — NR0, NR1, NR2, NR3, ENRO SH6F4, R0, R1 SH6E4, SD1 SH6E7

DIAGNOSE/INTERRUPTERZEUGUNG
DIAGNOSIS/INTERRUPT GENERATION

T

SH7C4

D640-A 74HC14T-L — END0 SH7B4
D640-B 74HC14T-L — END1 SH7B4

D650-A 74HC4051T-L (MUX0X) — REFERENZ 10KOHM / REFERENCE 10KOHM 200 — R650 10K
DIAG.VQ100 SH6D6
DIAG.VTDAC SH6F9
DIAG.PLREF SH6B4
DIAG.PL100 SH6D6
DIAG.EXTREFSH6C11
DIAG.ZF300 SH3B5
DIAG.REF50 SH2D11

D660-A 74HC4051T-L (MUX0X)
DIAG.FDET SH5D4
R660 10K
DIAG.REF100 SH2D9
DIAG.REF600 SH3C11
DIAG.SD1V SH4D6
DIAG.ZFVCO SH4C12
DIAG.FSTEP SH5C12
DIAG.VSVCO SH5C4

L651 10UH B — R651 47 — C11 — VERSORGUNG +24V / SUPPLY +24V

+15V — R680 39.2K — N680-A LP365-L (3.24V) — R681 11K B — N680-B LP365-L (0.1V) — R682 330 — C685 100P
+5VD +5VD — R685 4.7K — R687 4.7K — N680-A LP365-L — D680-A 74HC132T-L — D680-B 74HC132T-L — D640-F 74HC14T-L — R688 10K — C688 220U 35V AL B — TPD SH7D4

+5VD — R693 3M3 B — D690 HSM52400 B — C690 1N
+5VD — R693 68K — R694 4.7K — N680-L LP365-L (5.7V) — R691 12.1K — N680-C LP365-L (0.14V) — C695 100P — R692 470
D680-C 74HC132T-L — D680-E 74HC132T-L — D640-E 74HC14T-L — D690 HSM3.300 A — C694 47NP — C695 47NP

Z650 100B B — R652 470 — X70A 19 DIAG-5V

+5VD — R649 4.7K — D640-C 74HC14T-L

* N.F. = NICHT BESTUECKT / NOT IN PCB

STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

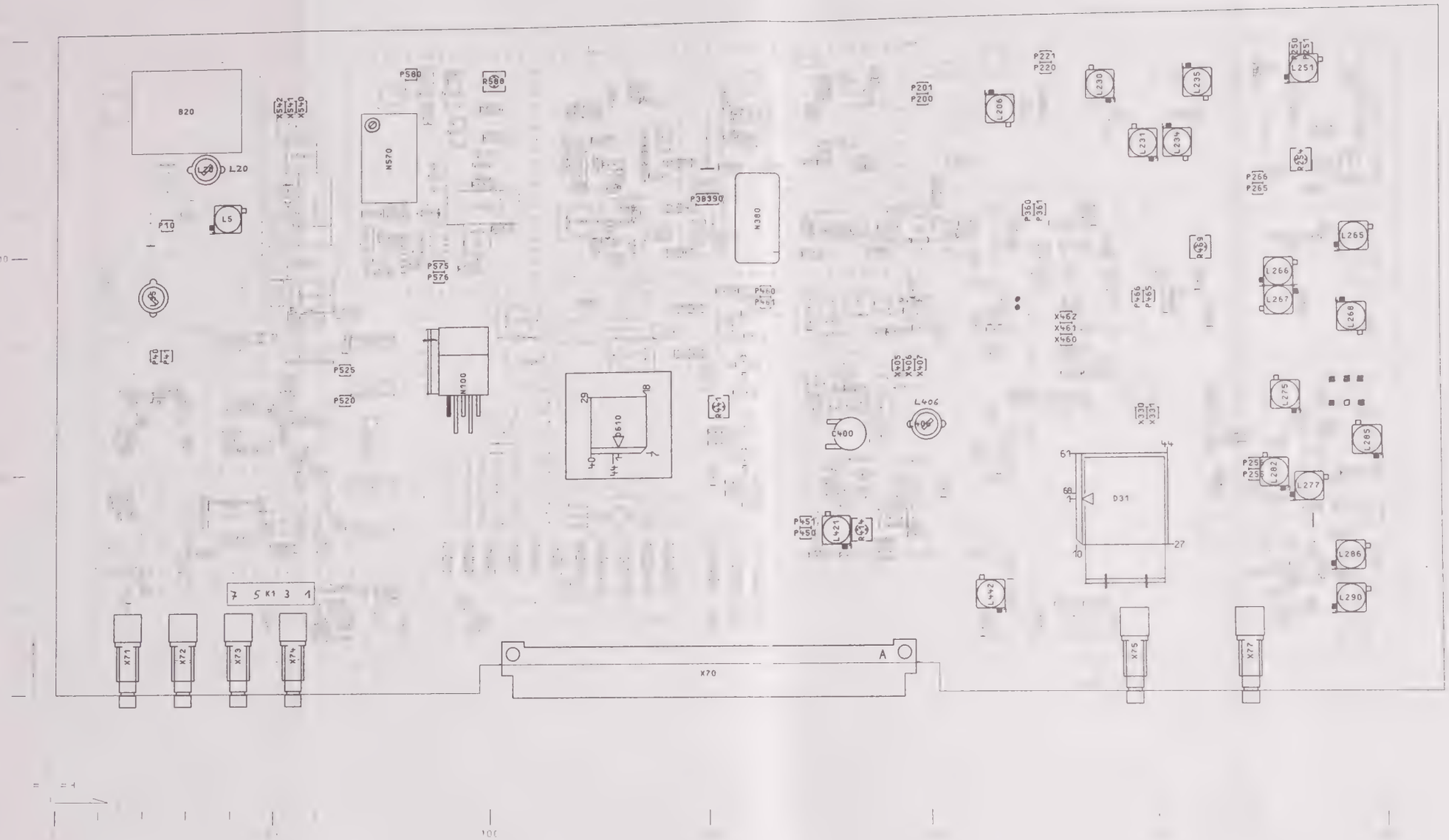
+5V — L630 2U2H L — C620 100N L — D600-E
+5VA — L630 2U2H L — C610 100N L — D630-B
+5VD — L650 2U2H B — C650 100N — D650-B, D660-B — C680 100N — D640-6, D680-E, D620-B — C660 100N
-15V — R659 15K — V680 5V6 B

+15V — R690 221K — N680-E — C690 100N L — C691 100N — -15V

ACHTUNG: EGB!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG
ATTENTION ESD!
ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING

1100		21.09.98	M	MEZ1	TAG	NAME	BENENNUNG
1200		08.10.1999	KL	BEARB		M	REFERENZ STEPSYNTHESE
				GEPR			REFERENZ STEPSYNTHESE
				NORM			
				PLOTT	21.09.98		
AEND. NR.	AENDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ			ZEICHN.-NR. 1035.6501.01$
				ZU GERAET	SMP		BLATT-NR. 7
				REG I V	1035.5005	ERSTE Z.	1035 5005

ZEICHN.-NR.



DARSTELLUNG SEITE B
VIEW ON SIDE B

ACHTUNG EGB!
ELEKTROSTATISCH GEFÄHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG
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BINDENDE ANGABEN ÜBER VARIANTEN BESTÜCKTE BAUTEILWERTE UND NICHT BESTÜCKTE BAUTEILE SIEHE SR

FOR BINDING INFORMATION ON MODELS EQUIPPING AND COMPONENTS VALUES AND NONEQUIPPED COMPONENTS SEE PARTS LIST

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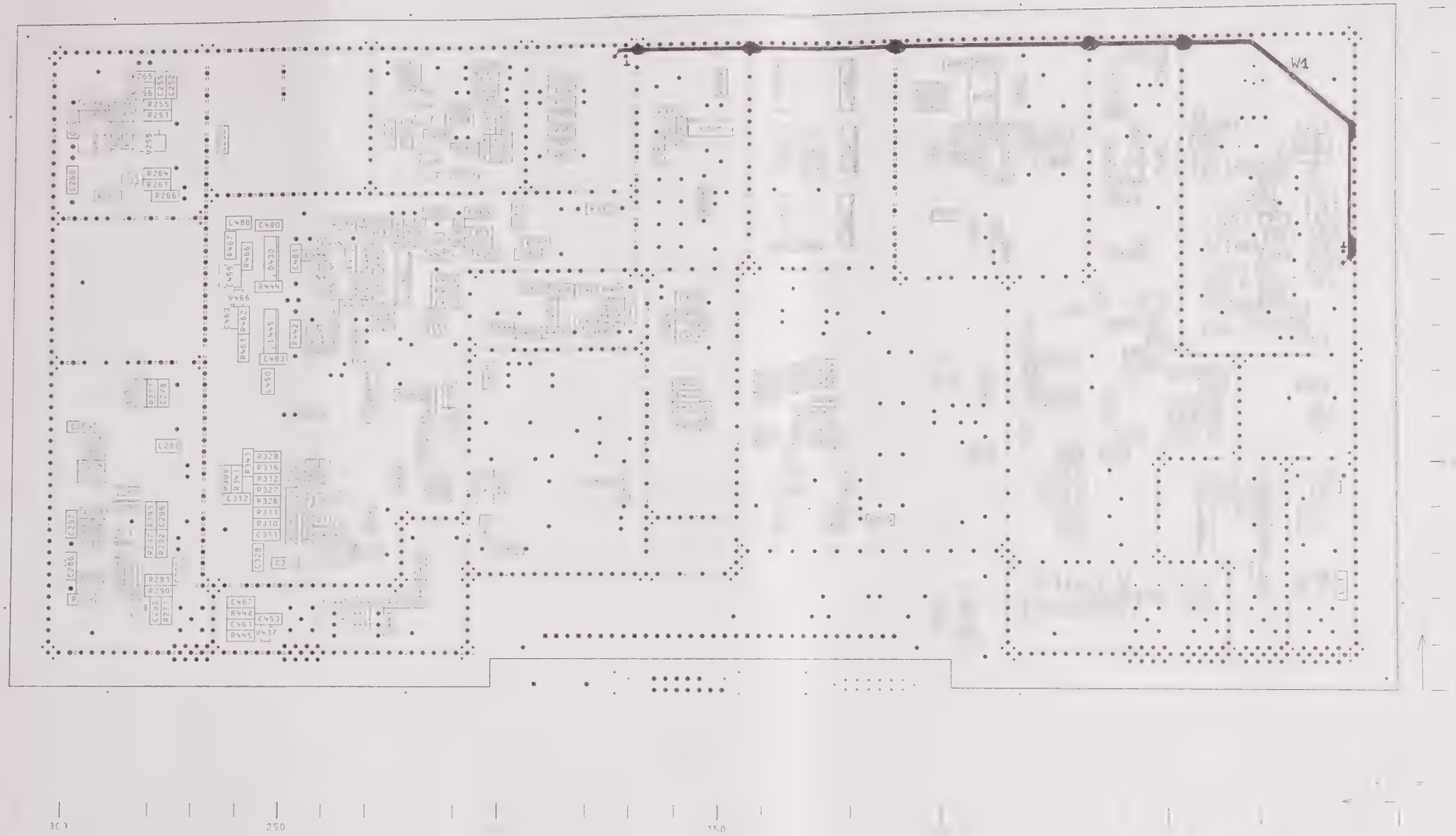
REFERENZ STEPSYNTHESE | Z
REFERENZ STEPSYNTHESE

ROHDE&SCHWARZ

1035.6501.01 | D | 1+



DARSTELLUNG SEITE A
VIEW ON SIDE A

ACHTUNG ESD!
ELEKTROSTATISCH GEFAEHRDETE BAUELEMENTE ERFORDERN EINE BESONDERE HANDHABUNG
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ELECTROSTATIC SENSITIVE DEVICES REQUIRE A SPECIAL HANDLING

BINDENDE ANGABEN UEBER VARIANTEN TRIMMWERTE BAUTEILWERTE UND NICHT BESTUECKTE BAUTEILE SIEHE SR

FOR BINDING INFORMATION ON MODELS, TRIMMING AND COMPONENTS VALUES AND NONFITTED COMPONENTS SEE PARTS LIST

REFERENZ STEPSYNTHESE Z

ROHDE&SCHWARZ

1035.6501.01 D 2-

MARKER